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ANALYSIS OF ARISTOLOCHIA RETICULATA, *Nuttall.*

By James Adams Ferguson, Ph. G.

[Abstract from a thesis.]

The drug was reduced to a number eighty powder. The moisture present was determined to be 10·70 per cent., and the inorganic constituents 11·40 per cent.; the ash contained carbonic, phosphoric and sulphuric acids, yielded to water 1·85 potassium salts, and to hydrochloric acid 3·35 salts of calcium, magnesium and iron, the undissolved, 6·20, being silica.

The extract obtained with petroleum spirit (boiling point 45°C.,) lost on heating to 105°C. one per cent. of volatile oil; the residue left was soft, resinous, fused at 66°C., was soluble in chloroform and benzol, and partly soluble in absolute alcohol.

The ether extract was soft, greenish-brown, resinous, slightly bitter, of an agreeable odor; spec. grav. 1·10; melting point 66°C.; soluble in absolute alcohol, chloroform and benzol; imparting to water an acid reaction; colored red-brown by H_2SO_4, and yellow-brown by HNO_3.

The extract with absolute alcohol, yielded to water nearly one half its weight (·85 per cent. of the drug), of soluble matter, the solution contained tannin, and gave precipitates with platinic chloride, phosphomolybdic acid, auric chloride and potassio-mercuric iodide. The tannin was determined in a fresh portion of the drug, by weighing the gelatin precipitate, occasioned in a decoction, in the presence of alum. The portion of the alcohol extract insoluble in water was weighed as phlobaphene.

The water extract, after deducting the ash (2·20 per cent.), weighed 8·00 per cent.; gum and dextrin were removed by successive precipitation with alcohol; malic acid was determined by precipitation with lead acetate, decomposition by H_2S, and precipitation with calcium-

chloride and alcohol. The glucose was estimated from the cuprous oxide obtained in alkaline solution, by igniting it and multiplying by .45.

From the soda extraction the albumen was precipitated by acetic acid and alcohol; the portion remaining in solution was weighed as extractive matter, after deducting the sodium acetate present.

The decoction with dilute hydrochloric acid when neutralized with ammonia and precipitated by alcohol, yielded pararabin. The starch was calculated from the glucose, and the calcium oxalate was determined by precipitating the decoction with sodium acetate, igniting the precipitate and weighing as CaO.

The results of the proximate analysis are tabulated as follows:

PROXIMATE ANALYSIS.

Soluble in petroleum spirit	4·20	
Volatile oil		1·00
Resin		3·20
Soluble in stronger ether	1·90	
Resin		1·90
Soluble in absolute alcohol	1·80	
Aristolochine, (approximately) soluble in water		·03
Tannin, soluble in water		·82
Phlobaphene		·95
Soluble in distilled water	8·00	
Mucilage		·60
Dextrin		·80
Glucose		·72
Malic acid and extractive matter		5·88
Soluble in caustic soda solution (0·2 per cent.)	3·10	
Albuminoids		·60
Extractive matter		2·50
Soluble in diluted hydrochloric acid (1 per cent.)	24·40	
Pararabin		1·80
Starch		6·48
Oxalate of calcium		·53
Albuminoids and extractive matter		15·59
Loss by chlorine treatment	5·78	5·78
Residue	23·09	
Cellulose and lignin		23·09
Ash	11·40	11·40
Moisture	10·70	10·70
Loss	5·63	5·63
	100·00	100·00

Volatile oil.—Ten pounds of the drug were distilled with water, and about one and a half fluid-ounces of volatile oil obtained. It was

of an amber-yellow color, aromatic odor, and camphoraceous taste; sp. gr.. 975; boiling point, 205° C.; did not congeal after keeping at —15° C. for two hours.

With a solution of one part bromine, and twenty parts of chloroform, the oil became colorless; with concentrated sulphuric acid, deep brown color, changing to red; with fuming nitric acid, reddish-brown. An ethereal solution of bromine (Prof. Maisch's test) was decolorized, then the oil changed to a greenish, brown, blue, dirty brown in quantity, and purple in thin layers. Iodine caused a deep brown color in quantity, but yellowish-brown in layers. The reactions, with bromine and iodine were quiet, and afterwards the oil acquired a terebinthinate odor.

Alkaloid.—This probably is "the bitter principle" of Chevallier and Feneulle. Chevallier obtained it, by precipitating the decoction with acetate of lead, exhausting the precipitate with hot alcohol, evaporating and treating the residue with water, which dissolved out the bitter principle. Feneulle found the bitter principle in the filtrate from the precipitate occasioned in the decoction, by acetate of lead. I tried both of these methods, and found that Feneulle's method was the one that separated the alkaloid. For obtaining the alkaloid five pounds of the drug were percolated with alcohol, the tincture evaporated, and the extract treated with water slightly acidulated with sulphuric acid. The acidulated filtrate was shaken with ether and the ether separated. The aqueous solution was treated with gelatin to remove tannin. The filtrate from the tannate of gelatin was made alkaline and shaken successively with ether and chloroform, both of which dissolved a yellow amorphous body which was made to crystallize by dissolving in ether, adding a few drops of water and allowing it to evaporate over sulphuric acid, when light-yellow needle-shaped crystals were left, which on being heated with soda lime, evolved ammonia. The crystals are inodorous, very bitter, and are soluble in water, 95 per cent. alcohol, ether, chloroform and benzol.

Color tests.—With concentrated H_2SO_4, a reddish-brown color; with fuming HNO_3, colorless; with H_2SO_4 and crystal of $K_2Cr_4O_7$, a brown color, changing to brownish-green; with concentrated H_2SO_4 and HNO_3, a pink color; with concentrated HCl, a pink color, and with Froehdes' test, a blackish-brown color. To this alkaloid I would suggest the name of *aristolochine*, the bitter principle of serpentaria having been named aristolochin by Chevallier.

ETHYL NITRITE.

SOME EXPERIMENTS ON THE COLOR, BOILING POINT AND SPECIFIC GRAVITY.[1]

By J. Geo. Spenzer, M. D.

Last winter, while engaged in the preparation of ethyl nitrite in somewhat large quantities, the conflict of authorities and text-books upon the boiling point, color and specific gravity, which I had observed several years ago while preparing some experimentally, recurred to me, and I decided to follow a line of experiments, which, although not expecting to alter the dispute one way or another, I hoped would give a happy medium of results upon these points.

A short description of the methods used and a few criticisms on the processes may be of interest.

The methods employed were:

1. Liebig. *Liebig's Annalen*, vol. 30, p. 140.
2. Emil Kopp. *Revue Scientifique*, vol. 27, p. 273.
3. Process of *United States Pharmacopœia*, 1880.
4. Carey Lea. *Americ. Jour. Sci.*, 2nd ser., vol. 32, p. 95.
5. Grosourdy. *Journal Chimie médicale*, or *Muspratt's Chemistry*, vol. 1, p. 834.
6. Feldhaus. *Liebig's Annalen*, vol. 126, p. 71.

1. Liebig's method is the one given in many of the standard text and reference books, and, as far as I can discern, yields a product much above any of the others in purity. It is prepared by passing nitrogen trioxide (formed by heating starch and nitric acid in a capacious retort) into a Woulffe bottle containing a cold mixture of one part of 85 per cent. alcohol and two parts of water, the nitrogen trioxide passing through the alcohol, forms ethyl-nitrite, which immediately distills off and is condensed by means of a Liebig's condenser or a Mohr's worm surrounded with a freezing mixture; it is then washed with water to remove alcohol and dried over calcium chloride.

2. Kopp's method. This is recommended by Beilstein (*Beilstein, Handbuch der Organischen Chemie*, vol. 1), as forming a product which is but seldom equalled.

It is also the method used by Strecker in his researches on the ac-

[1] Read before the Ohio Pharmaceutical Association at Akron, June 8th, and communicated by the author.

tion of caustic potassa on ethyl nitrite (*Liebig's Annalen*, vol. 77, p. 331).

It is prepared by adding copper turnings to a mixture of equal parts of nitric acid and alcohol contained in a retort connected to a cooling apparatus; the action which starts up is sufficient to cause the ether to pass over without the application of external heat. It may now be either washed and dried or proceed as Kopp directs, *viz*, pass the ether in the state of vapor through a wash-bottle containing water, which in turn is connected to a calcium chloride drying-tube, and this latter to a cooling apparatus, and the pure ether collected.

3. United States Pharmacopœia Process. A mixture of alcohol, sulphuric acid and nitric acid is distilled, and the distillate washed with water.

4. Method of M. Carey Lea. Is similar to the preceding one, with the exception that ferrous sulphate is employed in place of the sulphuric acid.

5. Grosourdy uses a mixture of either nitrite or nitrate of potassium, alcohol and sulphuric acid; this he heats gently for forty-eight to seventy-two hours, when the ether distills over.

6. Feldhaus claims the following method to be the best after having tried others; it is, a mixture of potassium nitrite, water and alcohol is poured gradually into a cold mixture of alcohol, water and sulphuric acid, contained in a distillatory apparatus, heat enough is produced in the reaction to carry it through, and the ether distills off. In methods 3 and 4 some ordinary ether is produced.

In 5 a large amount of aldehyde is formed. In all the processes undecomposed alcohol passes over; this is particularly so in 5 and 3.

In 1 and 2, as Watts (Gmelin's Handbook) suspected, and as Schmidt and Duflos have proved, a small amount of ethyl chloride is produced when calcium chloride is used as a drying agent.

The following general method was used in purifying the products of the several methods, *viz:*

The distillate was shaken with one-third its volume of ice-water vigorously, three successive times. After the third washing, the ether was separated as much as possible by means of a separatory funnel, and the washed ether shaken occasionally in half hour with pure recently ignited potassium carbonate, allowed to settle, decanted into a dry flask, and distilled. During this treatment No. 5 alone browned the potassium carbonate used.

Color.—The weight of authority, and all the standard chemical works give the color as a light yellow.

Grosourdy and Couerbe, however, contradict this.

Grosourdy (*Journal Chimie médicale,* or Muspratt's Chemistry, vol. 1, page 835), refers the color to a hydrocarbon and says it may be removed by repeated distillation from potassium carbonate.

Some ethyl nitrite was prepared according to Grosourdy's method, following the process out in every detail, a faintly yellow straw-colored liquid was collected in the receiver; when this was shaken with ice-water, however, it at once diminished in volume and formed two layers, an upper layer of a bright yellow color the exact counterpart of ethyl-nitrite, and a lower colorless layer, a mixture of alcohol and water. This upper layer was now subjected to six distillations with potassium carbonate; the distillate kept growing lighter and lighter, until the last ones were almost colorless. The boiling point, however, had rapidly risen to 60°-78°C.; it burned and otherwise denoted its alcoholic nature. If the almost colorless liquid be shaken with ice water, or if before each redistillation, the distillates be washed with water a yellowish liquid will always separate out.

The decomposition of the ether by distillation with potassium carbonate is well known and was proven on the ethers of all the processes.

Couerbe said the color was due to an oil, which could be removed by successive distillations from sugar.

For the purpose white rock-candy was powdered and boiled with some ethyl-nitrite, made after Liebig's method, in a flask, connected with a reverse condenser for two hours, when it was distilled off, and the process continued with a fresh portion of sugar and again distilled off; this was kept up for a day, distilling four times, but no signs of a fading of color presented themselves.

BOILING POINT.

Liebig made the boiling point.....	16·4°C.
Mohr " " " "	17·5°—18°C.
Brown " " " "	16·6°—17·8°C.
Thénard " " " "	....21°C. at 730 mm. barometric pressure.

Strecker (Kurze Organische Chemie, 2te. Auflage), gives it at 16° C.

The following method was used in determining the boiling point:

The ether decanted from the carbonate of potassium was poured into a small Wurtz fractional distillation flask, with a plain neck, around which was wrapped several thicknesses of paper; the flask was now connected to a condenser and fitted with a caoutchouc stopper, through which a thermometer passed into the liquid. In the final determinations, which represent some fifty or more, a Geissler standard thermometer was used.

The heat applied was very gentle, using the palm of the hand, while the temperature of the room in no case was above + 12° C., and in the greater number of determinations was from + 3° to + 4° C.

At first, the boiling point was secured by allowing the liquid to boil thoroughly, then allowing it to cool, and again boiling, during which the bulb of the thermometer was alternately raised to one-half inch below the orifice of the exit tube and again lowered into the liquid; this was to see whether the boiling liquid and its vapor were of the same temperature. In the majority of instances they were the same, while in a few only was there an advance of one-tenth of a degree in the boiling liquid. The readings were made as rapidly as possible and with a magnifying glass. The barometric pressure was also carefully noted.

Ethyl nitrite prepared according to one, four and five were tried in this manner.

Ethyl nitrite after No. 1, gave in the preliminary a boiling point of 16.5° C., whilst that from Carey Lea's method gave 17° C. The mean average of all the determinations was 17° C. This comprises about seventy trials.

To conclude the boiling point determinations, some six ounces of freshly-made Liebig's ethyl-nitrite was subjected to fractional distillation.

The apparatus consisted of a Wurtz flask connected by an adapter to a Mohr's worm, which was surrounded with a freezing mixture. The heat, which was very gently applied to the flask, was sufficient to keep the liquid in a state of constant ebullition; with the thermometer in the liquid the same began boiling at 13·3° C., when the boiling continued vigorously up to 16·3°. It required eight minutes to reach this temperature, and one and a half drachms of liquid were obtained.

The thermometer was now raised until the bulb was half an inch below the opening of the exit tube; it required fifteen minutes to

raise from 16·3° to 16·6° C. At 16·7° C. it remained for twenty-five minutes; while it required an hour to reach above 16·8° S. Between the temperatures 16·3° C. and 16·8° C. one ounce was obtained. The rise in temperature up to 16·9° C. required one hour. When it ran up to 17° C. two ounces had been obtained. The receiver was now changed and one and a half ounces were obtained at this temperature. At 17·2° C. all of the liquid had distilled over; the barometric pressure was 758·7 mm.

Lea's ethyl nitrite, treated in the same manner, started at 16·1°C, and ran rapidly up to 17·3°C., and finished at 17·8°C. Barometer pressure 759·2 mm.

Grosourdy's ethyl-nitrite, at 760 mm. barometer pressure, distilled between 19·38°C. and 19·88°C.

SPECIFIC GRAVITY.

This was taken at 0°C. by means of a delicate Sprengel picnometer.

Liebig found the sp. gravity at		15°C.	.947
Brown	"	15·5°C.	.900
Mohr	"	15·5°C.	.898
Dumas and Boullay found the sp. gravity at		+ 4°C.	.886

The mean of 6 determinations made

Liebig's ethyl-nitrite at		0°C.	.919
Lea's	"	"	.920

This is using the ethyl nitrite before fractioning it.

From the results of these experiments, I think it may be fair to conclude:

1st. That ethyl nitrite has, as yet, not been made colorless, and that it is light-yellow.

2d. That the boiling points, 16° to 16·5° C, are probably too low, and that 18·5° to 21 °C are possibly too high; also, that the boiling point given by most French and some German works, 17° C., is the nearest correct.

3d. The specific gravity of ·947 at 15° C., is undoubtedly too high, as it has not been corroborated; that ·886 at + 4° C. is too low, and that ·900 at 15·5° C. is nearest and about right.

It is unfortunate that most of the authorities do not say which method was used to prepare the ethyl nitrite; it is here, without doubt,

that most of the difficulty occurs, as the products of the several methods, although seemingly similar when superficially examined, are very dissimilar when closely scrutinized.

These experiments, which extended over a period of five months, were to have been concluded by determinations of vapor density, coefficiency of expansion, and specific gravity at the various temperatures, when they were cut short by the approach of warm weather.

ABSTRACTS FROM THE FRENCH JOURNALS.

[Translated for the AMERICAN JOURNAL OF PHARMACY.]

BISULPHIDE OF CARBON FOR PULMONARY AFFECTIONS. Dr. Guerra Estape, (*Revista de Ciencia Med.; Nouveaux Remèdes,* Aug. 8, 1887), claims to have cured several cases of chronic bronchitis and one of consumption, with this remedy. Experiments made upon himself seemed to show that the medicament was largely eliminated by the lungs; air from the lungs conveyed by means of a glass tube through Fehling's solution, gave a flocculent precipitate of sulphate of copper. The medicine gave rise to no unpleasant symptoms and was effective when a mixture, as follows, was administered in doses of 15 gm. once daily: Sulphide of carbon, 25 gm.; water, 500 gm.; ess. menth. 30 drops. Patients were forbidden to use alcohol, its being liable, according to the author, to act upon the bisulphide in the blood, thus forming sulphuretted hydrogen.

RESEARCH OF POTASSIC NITRATE IN THE CHLORATE. Jorissen (*Jour. de Phar.*, Antwerp, July; *Arch. de Phar.*, September 5th), gives a short method based on the transformation of nitric into nitrous acid, under the influence of nascent hydrogen; and upon the use of Griess' reagent, the hydrochlorate of metadiamidobenzol, which is now in general use in laboratories for finding nitrous acid. A few grammes of the chlorate to be examined are heated in a test-tube with ten ccm. of distilled water; let stand a while and decant; add three drops acetic acid (concent.), and a fragment of pure distilled zinc; let stand five or ten minutes, remove the zinc and add a few drops of the reagent of Griess. If a nitrate is present in the chlorate, the mixture, on agitation, will turn red. The color grows deeper and deeper, and in the presence of one per cent. of nitrate becomes brown. The test is sensitive to minute quantities.

CANADOL is described by Dr. Pliouchkine (*Bull. Méd.*, Aug. 21), as a hydro-carbon from American naphtha, transparent, very volatile, having an odor of benzin, and as being insoluble in water and alcohol. Using it as a local anæsthetic[1] he obtained the desired effect in one minute; unlike the effect obtained from ether, the sense of coldness lasted for several minutes. He was thus able to use it in enucleations and minor surgical operations. The cost is very moderate.

CANTHARIDES of a worthless nature—the active constituents having been removed by ether—are said by the *Bull. Soc. Phar. Bruxelles*, to be met with in the market. The article looks well and has the characteristic odor, but, pressed between the fingers it lacks substance. An ethereal tincture of good cantharides is of a greenish-yellow color. The extract is thick, of a greenish-yellow color and contains crystals of cantharidin; applied to the skin it produces a blister. Ethereal solutions of the fraudulent article are nearly colorless. The extract is brownish-yellow; there is no trace of crystals in it, and it will not blister.

LANTANINE AS A SUBSTITUTE FOR QUININE. In *Nouveaux Remèdes*, Aug. 24, lantanine is described as an alkaloid of *Lantana brasiliensis*. Like quinine, it is said to act upon the circulation, retard nutrition and lower the temperature. It is supported by the most delicate stomachs. According to M. Buiza (Lima), intermittent fevers, which are rebellious to quinine, give way to the influence of two grammes (*sic*) of lantanine. Its antipyretic powers are obtained by giving one or two grammes in twenty-four hours in pill form, each pill containing ten cgm. In intermittent fevers lantanine should be given immediately after the attack, and in ninety-nine cases out of one hundred, so says the author, it will not return. The medicament is given in pill form on account of its very bitter taste. (See also AMERICAN JOURNAL OF PHARMACY, 1886 p. 611).

PYRIDINE FOR ASTHMA.—Germain Sée, according to *Nouveaux Remèdes*, Aug. 24, recommends that it be inhaled three times a day for twenty minutes, from a warm saucer into which a teaspoonful of the pyridine has been poured. After each sitting the patient should take a tablespoonful of the following: Syr. tolu and syr. papaveris, of each 250 gm.; pot. iodidi, 25 gm.

[1] This is probably identical with *rhigolene* mentioned in this JOURNAL in 1866 p. 363; 1868 pp. 349, 350, and 1885 p. 206.—EDITOR.

THE REACTIONS OF ACETANILID (antifebrin) are given in the *Arch. de Phar.*, Sept. 5. Warm solutions redden with perchloride of iron, and dilute chromic acid gives a darker shade of the same color. When acetanilid is heated with nitrate of mercury it dissolves; the addition of sulphuric acid gives a bright red. This reaction is common to resorcin, phenol, thymol and salicylic, tannic and gallic acids; benzoic acid is an exception. It may be isolated with ether or chloroform from urine to which it has been previously added. But this reaction does not take place in the urine of patients who are taking the medicament, showing that it had undergone a change before reaching the urinary organs. Such urine should be treated by ether, then by caustic soda; this should be neutralized with sulphuric acid and the ether evaporated. By this means Cahn and Hepp claim to have obtained crystals presenting the characteristics of acetanilid. Della Cella also obtained these crystals, but states that they did not give the reactions indicated above.

PTOMAINES.—Following are the principal facts and conclusions developed in the recent researches of Brouardel, Ogier and Minovici, upon the cadaveric alkaloids, and communicated to the Paris Academy of Medicine, June 28, 1887. (See also AMERICAN JOURNAL PHARMACY, May, 1887). The liver and kidneys furnished residua which generally gave the same reactions. The most abundant residua were given by amylic alcohol (alkaline solution), next came benzin and chloroform (acid solution). In a single case (fœtal and free from putrefaction), no alkaloidal reaction was presented. In all others, basic substances were obtained capable of precipitation by the general reagents; the most sensitive of the latter was liq. iodinii comp. The residua appeared in notable quantity in viscera newly putrefied (two to four days in summer); they were more abundant in cadavers of eight to twenty days. After two years or over, the amount of ptomaïnes visibly diminished. An examination of our tables will give an idea of how much confidence should be accorded to the various colored reactions in searching for toxic vegetable bases, and will show the influence of the ptomaïnes upon these reactions. For example: perchloride of iron gave no coloration; hence it is a good reagent for morphine; alcoholized potassa, after oxidation by nitric acid, gave no violet reaction, comparable with that which atropine would give; nitric acid alone generally produced yellow or orange colorations, much less intense than brucine would have given, but capable, up to a

certain point, of being confounded with the tint which a trace of morphine would have given. The use of reagents containing a large excess of sulphuric acid (molybdate, vanadate, selenite, etc.,) is made very uncertain by the presence of ptomaïnes. We obtained, in fact, colorations of variable tones, reddish, sometimes violet, and oftener identical with those which sulphuric acid alone would have given. With bichromate and sulphuric acid we saw produced on a single occasion only, a violet tint analogous to that which a trace of strychnine would give. With alcoholized sulphuric acid and ferric perchloride, certain residua gave greenish tints, which could be confounded with the coloration given by digitalin in like conditions. It is important therefore, to take account of the various causes of error, but we must not exaggerate their importance. The colorations due to the ptomaïnes are never in fact so clear and so evident as colorations of the same kind produced by vegetable bases. If we remember that a single color-reaction would not suffice for the official conclusions of the expert, and that he would also have to depend upon the agreement of a group of chemical or physiological signs, we will see that the chances for error are in reality infinitely small. But if it appears to us altogether improbable that the medico-legal expert would confound a ptomaïne with a vegetable base, it is also very certain that the presence of the ptomaïnes would obscure, in a large measure, the clearness of reaction in the toxic alkaloids which might really exist in the extraction made; and consequently that small quantities of these alkaloids might remain unperceived. The complete purification of the residua, the separation of the ptomaïnes and the vegetable bases is, therefore, for toxicological research, a problem of the highest importance, and one whose solution is yet to be found.—*Archives de Pharmacie,* August 5, 1887.

Lanolin v. lard.—Experiments made with a view of determining the relative value of lanolin in promoting absorption through the skin have been reported upon by Dr. Guttman in the *Med. Chron.*, potassium iodide and salicylic acid being used, as being readily detected in the urine. Ointments of equal strength, made with lanolin and with lard, were used upon four different patients, and, in the subsequent examination of the urine, the most frequent and distinct indications of the absorption of the iodide or of salicylic acid were found after the use of the lard ointment. At any rate, the results are considered to prove, at least, that lanolin possesses no superiority over lard in promoting the absorption of potassium iodide or salicylic acid through the skin.—*Am. Pract. and News.*

REACTIONS OF KAIRINE, ANTIPYRINE AND ANTIFEBRIN.

Translated from L'Orosi, 1887, pp. 114 and 274, by Jos. W. England, Ph. G.

Kohn, in *Jour. d'Alsace-Lorr.*, gives the following: *Kairine*, with a drop of ferric chloride in a weak aqueous solution, instantly, assumes a violet color that rapidly passes to brown. An excess of ferric chloride to a strong solution of kairine produces an almost black precipitate. Bichromate of potassium, in neutral solution, gives an intense coloration and separates a violet pigment, on standing, which, dissolved in alcohol, forms a black solution.

Antipyrine in weak solution, forms a rose color with ferric chloride that is visible in a 1 to 100,000 solution. With nitrous acid added to a dilute solution, a blue-green color is produced, while in the concentrated solution, green crystals are deposited.

Antifebrin with the reagents previously mentioned undergoes no change, but boiled with potassium hydrate, evidence of the existence of aniline is obtained and, after distillation, potassium acetate may be found in the retort. (See also page 491.)

In the *Apoth. Zeitung* the following test is given for antifebrin: Boil a few centigrams of antifebrin, with one cc. of officinal solution of potassium hydrate, and hold suspended in the tube a glass rod, which has been dipped in a solution of chlorinated lime; the drop of solution suspended on the end of the rod will acquire an amber color, which, on continuing the ebullition, passes little by little to violet. This violet coloration results from aniline, which is produced from the antifebrin by the boiling caustic potassa. It may be well to further note that if the test is made directly with aniline, the violet coloration of the drop appears at once, without the primary change to amber color, as in the case of antifebrin.

A formula for ergot, hypodermatically.—Hildebrandt recommends the following:

Aqueous extract of ergot	3 parts.
Glycerin	
Distilled water, each	7 parts.

From five to twenty drops may be injected beneath the integument of the thigh or abdomen to check uterine hemorrhage.—*Journal de Médecine; Med. News*, Aug. 20.

NEW METHOD FOR THE VOLUMETRIC ESTIMATION OF UREA.

By Dr. G. Campari.

Translated from "Annali di Chim." 1887, page 156, by Jos. W. England, Ph. G.

This method is based upon the decomposing action exercised by nitrous acid upon urea to form carbonic anhydride, nitrogen gas and water. In a glass flask of about 200 cc. capacity, place 20 cc. of a 10 per cent. solution of nitrite of potassium, then 2 cc. of the urine, or of the liquid containing the urea, and then 2 cc. of a 5 per cent. solution of sulphuric acid (or 1 cc. of the diluted sulphuric acid of the U. S. P., 1880). After the addition of the acid, through the safety tube, conduct the evolved gases through the other tube alongside, descending into a flask containing 110 cc. of lime-water. Warm, very slightly, the urea containing flask, so that the reaction takes at least fifteen minutes time. When the connecting tube becomes warm, from hot aqueous vapor, the operation is at an end and the lime solution should be removed at once.

Now measure 10 cc. of this liquid, turbid with its suspended calcium carbonate and color rose-violet, with a drop of an alcoholic solution of phenol-phthaleïne and, first, determine the number of cc. of a solution of oxalic acid, containing 3·15 gm. to the liter, that are needed to neutralize the 10 cc. of the liquid. Then multiply the volume of the oxalic acid solution used by 0·0165 and subtract the product from the number 0·15; the difference indicates the amount of urea contained in the 2 cc. of urine, or the urea containing liquid examined.

Pavesi and Rotondi have found that 1 cc. of lime-water is neutralized by 0·00241 gm. of tartaric acid; therefore every cc. contains 0·001273 gm. of CaO, and 110 cc. of lime-water should then contain 0·14003 of CaO; corresponding to 0·15 gm. of urea. The chemical reactions of this new process, are as follows, first:

$$CO(NH_2)_2 + 2\,HNO_2 = 3\,H_2O + 4\,N + CO_2$$

Urea, 60 94 54 56 44

Secondly:

$$CaO + CO_2 = CaCO_3$$

56 44 100

Now since 44 gm. of CO_2 are equivalent to, or neutralize, 56 gm. CaO, then 56 gm. of CaO are equivalent to 60 gm. of $CO(NH_2)_2$, for 60 gm. of $CO(NH_2)_2$ yield 44 gm. of CO_2 (as seen in the first

equation); and if 56 gm. of CaO equal or represent 60 gm. of CO $(NH_2)_2$, then 0·14003 gm. of CaO (the amount contained in the 110 cc. of lime-water employed) equals 0.15 gm. of urea, thus:

56 : 60 :: 0·14003 : 0·15.

Then if you employ 110 cc. of lime-water and if, after the operation, you subtract from the number 0·15, the quantity of urea corresponding to the lime not precipitated by CO_2 in the 110 cc. of lime-water, you will have the quantity of urea corresponding to the lime precipitated. In order to know the quantity of urea corresponding to the CaO not precipitated (which remains in solution), take from the product, that one molecule of oxalic acid neutralizes, one molecule of CaO, and this corresponds analytically, to one molecule of urea. Then, if 1000 cc. of the above oxalic acid solution corresponds to 1·5 gm. of urea, 1 cc. corresponds to 0·0015 gm. of urea. Therefore multiply the number of the cc. of the solution of oxalic acid used (to neutralize the 10 cc.) by 0·0015, which equals, equivalently, the quantity of urea in 1 cc., or, which is the same thing, multiply that number by 0·0165 for 11 times the proportion) this will give the urea corresponding to the lime left in solution), and subtract this quantity of urea from 0·15 (urea corresponding to the lime contained in 110 cc. of lime-water); the difference represents the urea corresponding to the lime precipitated and contained in the liquid analyzed.

Dr. Campari gives the results of a number of determinations, first, upon a solution of urea, 25 to 1000, and then upon urine, in comparison with the well-known process of Liebig; the latter results are as follows:

Urine used.	Oxalic Acid used for 10cc. of Lime-Water.	Urea in 1 Liter, (Campari.)	Urea in 1 Liter, (Liebig.)
2 cc.	6·6 cc.	20·55 gm.	20·20 gm.
2 cc.	6·3 cc.	23·05 gm.	22·90 gm.
2 cc.	6·45 cc.	21·80 gm.	21·55 gm.
2 cc.	6·95 cc.	17·70 gm.	17·35 gm.

These results, according to the author, demonstrate that this nitrous acid method conduces to the best results obtainable. But in order to secure absolutely accurate results, it is necessary that the heating of the flask be slow, in order to avoid, especially, the raising of the vapor of nitric acid that could be formed, by the decomposition with the sulphuric acid, from the potassium nitrate, always present in the commercial nitrite.

In the rule previously given, there are directed 110 cc. of lime-water rather than 100, in order to facilitate analytical calculations. 110 cc. of lime-water contains 0·14003 gm. of CaO, that corresponds to 0·15 of urea; this number is easy to remember, while the same can not be said for the number 0·1363 (urea) corresponding to the lime (0·1272) contained in 100 cc. of lime-water.

In conclusion, the subjoined equivalent table is given, in which is stated the quantity of urea contained in a liter of any possible sample to be examined, indicated by the number of cubic centimeters of the oxalic acid solution used to neutralize 10 cc. of the lime-water.

Oxalic Acid used, (cc.)	Urea, (per liter.)	Oxalic Acid used, (cc.)	Urea, (per liter.)	Oxalic Acid used, (cc.)	Urea, (per liter.)	Oxalic Acid used, (cc.)	Urea, (per liter.)	Oxalic Acid used, (cc.)	Urea, (per liter.)
4·0	42·00	5·0	33·75	6·0	25·50	7·0	17·25	8·0	9·00
4·1	41·20	5·1	32·95	6·1	24·70	7·1	16·45	8·1	8·20
4·2	40.35	5·2	32·10	6·2	23·85	7·2	15·60	8 2	7·35
4·3	39·55	5·3	31·30	6·3	23·05	7·3	14·80	8·3	6·55
4·4	38·70	5·4	30·45	6·4	22·20	7·4	13 95	8·4	5·70
4·5	37·90	5·5	29·65	6·5	21·40	7·5	13·15	8·5	4·90
4·6	37·05	5·6	28·80	6·6	20·55	7·6	12·30	8·6	4·05
4·7	36·25	5·7	28·00	6·7	19·75	7·7	11·50	8·7	3·25
4·8	35·40	5·8	27·15	6·8	18·90	7·8	10·65	8·8	2·40
4·9	34·60	5 9	26·35	6·9	18·10	7·9	9·85		

THE FORMS OF ALBUMEN IN THE URINE, AND THEIR TESTS.[1]

By Dr. T. Grainger Stewart, Physician in Ordinary to the Queen for Scotland.

The forms of albumen met with in the urine are :—

I. *Serum Albumen*, a substance which, according to Hammarsten, constitutes 4·516 per cent. of the blood serum. It is almost constantly present in urine which contains any variety of albumen. Although a less diffusible body than serum globulin, it is capable of passing through membrane.

II. *Serum Globulin or Paraglobulin*, the globulin of the blood serum, of which it constitutes 3·103 per cent. It is met with in almost all albuminous urines, its proportion to the serum albumen varying in different instances.

[1] From a lecture delivered at the University of Edinburgh ; reprinted from *Quart. Compend. of Medical Science.*

III. *Peptone*, a product of gastric and pancreatic digestion of albuminous substances, also occurring in the process of transformation of tissues and of inflammatory effusions. It is a readily diffusible substance, occasionally met with in the urine in association with or apart from serum albumen.

IV. *Propeptone, or Parapeptone, or Hemialbumose*, a substance or group of substances intermediate between albumen and peptone, constituting a stage or stages of transformation from the one to the other. It is highly diffusible, and is occasionally met with in the urine under conditions corresponding to those under which peptone occurs. This is the peculiar form of albumen which was discovered in the urine by Dr. Bence Jones, in a case of osteomalacia.

V. *Acid Albumen, or Syntonin*, one of the derived proteids obtained by the action of acids upon albumen. It is easily produced artificially by the addition of acid to albuminous urine, but may occur naturally in certain cases.

VI. *Alkali Albumen*, another derived proteid, produced by the action of alkalies upon albumen. It is readily produced artificially, but is also found naturally in the urine.

VII. *Hæmoglobin*, the combination of hæmatin and globulin naturally existing in the red corpuscles of the blood. It sometimes appears in the urine, particularly in cases of hæmaturia and hæmoglobinuria, also in certain septic conditions, and after inhalation of arseniuretted hydrogen, transfusion of blood, and otherwise.

VIII. *Fibrin*, a proteid substance which does not normally exist as such in the blood. It is met with in the urine in hæmaturia, in some cases of chyluria, and in certain varieties of renal casts.

IX. *Mucin*, the chief constituent of mucus, is a derived proteid substance. It frequently becomes superadded to the urine after secretion, and may be derived from any part of the urinary tract.

X. *Lardacein, Waxy or Amyloid Material*, familiarly known as a pathological substance within the body, is said to be occasionally demonstrable in renal casts.

Of these ten varieties the last four are of little practical importance —mucin alone being indeed worthy of special comment, and that mainly because of the difficulties which its presence raises in regard to the reliability of certain tests for serum albumen.

As to the tests for the albumens, he puts in tabular form the

chief tests for the different varieties of albumen, with their actions upon each variety.

TABLE 1.—SHOWING TESTS FOR THE CHIEF FORMS OF ALBUMEN.

	SERUM ALBUMEN.	SERUM GLOBULIN.	PEPTONES.	PROPEPTONES.	ACID ALBUMEN.	ALKALI ALBUMEN
Heat.						0
Heat with nitric acid. Heat with acetic acid.	Opacity.	Opacity.	0	0	0	Opacity.
Cold, nitric acid.	Opacity.	Opacity.	0	Opacity dissolved by heat.	Opacity.	Opacity.
Metaphosphoric acid.	Opacity.	Opacity.	Opacity diminished or dissolved by heat.	Opacity diminished or dissolved by heat.	0	Opacity.
Acidulated brine.	Opacity.	Opacity.	Opacity diminished or dissolved by heat.	Opacity diminished or dissolved by heat.	Opacity.	Opacity.
Picric acid.	Opacity.	Opacity.	Opacity dissolved by heat.	Opacity dissolved by heat.	Opacity.	Opacity.
Potassio-mercuric iodide.	Opacity.	Opacity.	Opacity dissolved by heat.	Opacity dissolved by heat.	Opacity.	Opacity.
Potassium ferrocyanide.	Opacity.	Opacity.	0	Opacity dissolved by heat.	Opacity.	Opacity.
Dilution with water.	0	Slight opacity.	0	0	0	0
Magnesium sulph.	0	Opacity.	0	0	Opacity.	Opacity.
Fehling's solution.	Brownish-red or mauve.	--	Rose pink or purple.	Rose pink or purple.		
Randolph's test.	--	--	Yellow opacity.	Yellow opacity.		

The oldest test for albumen depends upon *its coagulability by heat.* Heat coagulates the serum albumen (opalescence occurring at 60° C., coagulation at 72° to 75°), and also the serum globulin (opalescence occurring at 68° C., coagulation at 75°); has no effect upon the peptones, propeptones, nor upon acid or alkali albumen, unless an alkali or acid has first been added. It, however, produces cloudiness with phosphates, by driving off carbonic acid, which holds them in solution, and the further addition of nitric acid, by redissolving them, clears up the opacity. A preliminary acidulation with acetic or nitric acid prevents this cloudiness, but may convert albumen into acid albumen, and so make the test fail, but on the whole, if cautiously employed, heat will be found a good test. A further security may be obtained by using both acetic acid and a concentrated solution of magnesium sulphate, or of sodic sulphate or of common salt, for these prevent the undue action of the acid upon the albumen.

The *Cold Nitric Acid Test* ranks next in date of introduction and in general popularity to that by heat. When a layer of nitric acid is

brought into contact with a layer of urine, a white coagulum is formed at the line of junction of the fluids. The acid coagulates serum albumen, serum globulin, has no effect upon peptones; gives an opacity with propeptones, which, however, disappears with heat; has no effect upon acid albumen, but gives distinct reaction with alkali albumen. One or two sources of fallacy must be kept in view when one employs this test. It may give a precipitate with urates, with urea, or with resinous substances. Such fallacies may be avoided by the adoption of very simple precautions, which are fully detailed in the books on urinary analysis.

Metaphosphoric Acid is an excellent test for albumen, but as it is only serviceable when pure, and difficult to keep in that condition, it has not come into general use.

Acidulated Brine is also a test of considerable value, acting upon all varieties of albumen, but it is not likely to become greatly trusted, because of its frequently giving some reactions with normal urine.

Picric Acid is a test which has been brought into use in Great Britain mainly by the recommendation of Dr. George Johnson. It produces an opacity with all the forms of albumen; but while those with serum albumen, serum globulin, acid and alkali albumen persist or become more distinct with heat, those with peptone or propeptone dissolve. It must be remembered, also, that alkaloids, such as quinine, give a cloud with this reagent, but one which rapidly disappears with heating. On the whole, I believe this to be the most reliable and delicate test which we at present possess.

It has been objected to the test, that it precipitates mucin as well as serum albumen, and that this is a source of fallacy, particularly when it is used by the contact method. Careful investigations by Professor Stewart, showed that while a large number of the specimens gave distinct reactions both with picric and citric acids, there were three which gave an opalesence with picric and not with citric, and seven of those which reacted with citric acid gave no reaction with picric. From these facts he concludes that mucin may be demonstrated by citric acid when no reaction is produced with picric, and that picric may show minute quantities of albumen in urines in which citric acid fails to show mucin.

On the other hand, picric acid often produces an opalescence in urine apparently free from albumen, and Dr. Stevens made a series of careful experiments which seem to indicate that picric acid acts upon

mucin, although more slowly and less distinctly than does citric acid. The degree of acidity of the urine is probably an important element in relation to this reaction with picric acid; and Professor Stewart thinks that where acid is present in quantity the opalescence is distinct; where it is in slight amount, it is comparatively or completely absent.

It is likely that although picric acid often affects mucin, it does not do so in such a way as to render it unreliable as a delicate test for albumen. Its precipitate with mucin is, even when applied by the contact method, a slight, slowly developed haze. A precipitate indicating albumen is more marked and more quickly produced. A little practice in the use of the test will soon render any one familiar with the degree and rate of formation of the opacity which indicates albumen as distinguished from those which mark the presence of mucin.

Potassio-mercuric-iodide, which was first proposed as a test by M. Tanret, corresponds in its action to picric acid, giving opacity with serum albumen, globulin, acid and alkali albumen, and an opacity dissolved by heat with peptone and propeptone. But it will be found to give a reaction with a very large proportion of normal urines, and as the addition of an organic acid—citric or acetic—is required to bring out the reaction, it is clear that mucin must, in many cases, give a degree of opalescence. It may be that other sources of fallacy exist in regard to slighter reactions. Dr. Oliver's method of applying this test greatly reduces the chances of error, but its disadvantages render it an inferior test to the picric acid.

Potassium Ferrocyanide, first suggested by Dr. Pavy, also resembles picric acid in its action, except it does not give any indication with peptones. The objections which induced Professor Stewart to reject the reagent last described apply to this one also.

Dilution with water is a convenient but not very reliable test of the presence of serum globulin, as it produces a milkiness, that substance being soluble in weak saline solutions, but not in pure water or extremely diluted solutions of salts. It produces no effect upon other forms of albumen.

Magnesium Sulphate is a valuable test for serum globulin, as it produces a milky opacity with that substance, which speedily deposits as a precipitate. It has no action upon serum albumen, peptone or propeptone, but produces an opacity with acid and alkali albumen. It is best used in saturated solution by the contact method. By its use

also, according to methods described in works dealing with the subject of physiological chemistry, the globulin may be separated nearly pure, and its amount determined.

Fehling's Solution, or other alkaline solution of copper, is a most convenient test for peptone and propeptone, giving with these a rose-pink or purple color at the point of contact of the test with the supernatant urine and producing no effect upon the others, with the exception of serum albumen, with which it gives a brownish-red hue.

Randolph's Test for peptone and propeptone, which consists in the addition of one drop of saturated solution of iodide of potassium and then of two drops of Millon's reagent (an acid solution of nitrate of mercury) to a drachm of urine, gives a yellow, instead of a red precipitate when these substances are present; but as Randolph has pointed out, it gives the same color reaction with bile salts, which are frequently present in considerable amount in the urine. Therefore we cannot esteem it so highly as the copper and alkali test.

The presence of hæmoglobin may be made out by the guaiac reaction or by the spectroscope; the presence of fibrin may be ascertained by its decomposing with effervescence hydrogen peroxide; mucin may be discovered by means of citric or acetic acid; and waxy material may be shown (if it is ever present) by iodine, and sulphuric acid, or by methylaniline violet.

Table II will show the results of tests as to the relative delicacy of the principal tests for albumen. The first column shows the dilution up to which the action of each reagent remained distinct; the second shows the percentage of albumen, as calculated from the total quantity in the undiluted fluid and the number of dilutions; and the third shows the grains, or parts of a grain, per ounce, as calculated from the same data:

TABLE II.—*Showing the Comparative Delicacy of Tests for Serum Albumen.*

TESTS.	DILUTIONS.	PERCENTAGE.	GRAINS PER OUNCE.
Boiling	300	0.0005	0.00218
Acidulation with acetic acid, and boiling	500	0.0003	0.001311
Cold nitric acid	50	0.003	0.01311
Metaphosphoric acid	500	0.0003	0.001311
Picric acid	1000	0.00015	0.000655
Potassio-mercuric-iodide. (Test papers)	500	0.0003	0.001311
Ferrocyanide of potassium	500	0.0003	0.001311

The urine contained albumen to the amount of 1.5 grammes per liter, which is equal to 0.15 per cent., or 0.655 of a grain per ounce.

The results show that the *boiling test*, carefully applied, is an excellent one, revealing the presence of so little as 0.00218 of a grain per ounce, and continuing to show up to the 300th dilution of the standard specimen. But heat, with preliminary acidification with a little acetic acid, was still more delicate, showing 0.001311 of a grain per ounce, and giving a perceptible haziness up to 500 dilutions.

The Cold Nitric Acid Test falls far short of this in delicacy, for it does not give a distinct reaction beyond the 50th dilution, and therefore shows only with 0.01311 of a grain per ounce. It is true that if the specimen is allowed to stand, the reaction may gradually manifest itself, with minute traces of albumen; but this is inconvenient, and for practical use tests are to be estimated in proportion to their rapidity of action.

Metaphosphoric Acid gave the same results as heating after acidulation with acetic acid, *viz.*, showing till the 500th dilution of the standard urine, and 0.001311 of a grain per ounce.

Picric Acid proved the most delicate test, giving a faint but perceptible reaction up to the 1000th dilution of the standard specimen, which is equal to 0.00015 per cent., or 0.000655 of a grain per ounce.

The *Potassio-mercuric Iodide* and the *Ferrocyanide of Potassium Tests* gave the same results as metaphosphoric acid, showing albumen up to the 500th dilution of the standard specimen, equal to 0 001311 of a grain per ounce.

From these and other observations Prof. Stewart concludes that picric acid is the most delicate of all the reagents which we possess for albumen, and that next to it rank the potassio-mercuric iodide, the heating after acidulation with acetic acid, the ferrocyanide of potassium, and the metaphosphoric acid. Boiling and adding nitric acid is less delicate, and still less so is the cold nitric acid test.

But delicacy is not the only quality required of a test. Indeed, a test may be too delicate for practical purposes. And again tests otherwise suitable may be practically inconvenient. Nitric acid is difficult to carry about, and picric acid presents a similar disadvantage, although in a minor degree. The test pellets devised by Dr. Pavy, of London, and the test papers of Dr. Oliver of Harrowgate, are extremely convenient, being easily carried about, and very delicate. But it may be held that they are too delicate, for few urines fail to show

some reaction with them. Indeed, many of them show some reaction with practically normal urines. The smallest quantity of mucin may suffice to produce the reaction, or a quite infinitessimal trace of albumen proper. The tests must be used with discrimination, and too much importance must not be attached to their fainter indications. Albuminuria is rarely a serious condition unless it is sufficiently pronounced to be made out by the cold nitric acid test.

As to the quantitative analysis of albuminous urine, Prof. Stewart approves most highly of the coagulating, drying and weighing process. A less laborious process is that known as Esbach's method. This plan requires certain special tubes, graduated so as to show the height to which the urine to be tested, and that to which the reagent (a solution of picric and citric acids) should reach, also the number or proportion of grammes per liter. The urine is filled up to the level indicated by the letter U, then the test fluid to the line marked R, and the fluids having been thoroughly mixed, are set aside to stand for twenty-four hours. At the end of that time the level reached by the coagulum, enables us to read off the grammes per liter. The observations brought out a result, as is seen in the table, of 2·5 grammes per liter, which is equivalent to 0 25 per cent., or 1·0837 grains per ounce. It thus very closely corresponded to the results obtained by the first method.

Esbach's method brings out results closely corresponding to those obtained by the elaborate drying and weighing process. As the method is easily worked, as well as so reliable, it is a good one to adopt. Its only disadvantages are that one must wait twenty-four hours before the result can be obtained, and that it does not enable us to measure less than 0.5 grammes per liter.

PROTEIDS OF SEEDS OF ABRUS PRECATORIUS.[1]

By Sidney Martin, M.D., London.

The proteids of the seeds of abrus, the Indian licorice, are important physiologically, because they have been shown by Warden and Waddell[2] to be possessed of poisonous properties. To the poisonous

[1] From the "Proceedings of the Royal Society;" reprinted from *Phar. Jour. and Trans.*, Sept. 17th, p. 234.

[2] "The Non-bacillar Nature of Abrus Poison." By C. J. H. Warden and L. A. Waddell. Calcutta, 1884.

product extracted by these observers the name "abrin" was given; and though it was decided that abrin was closely allied to "plant-albumin," yet no experiments were recorded to show whether the product was a mixture or a single proteid. They obtained it by making a watery extract of the crushed seeds and precipitating with alcohol, the precipitate being afterwards collected and dried.

Before proceeding to an examination of the physiological action of the jequirity, it seemed to me desirable to determine the kind of proteids present in the seeds, and the present communication embodies the results of the inquiries made with a view to such determination.

Method of extraction of the proteids.—The method used was based on the supposition that the proteids present in abrus were similar to those in other seeds, consisting chiefly of proteids of the globulin and albumose classes.

The finely ground seeds were shaken first of all with chloroform to remove the red cuticle which sinks in this liquid, so that the yellow kernel-powder could be readily removed, and obtained in the dry state by allowing the chloroform to evaporate.

The powder obtained was then extracted with 15 per cent. sodium chloride solution for twenty-four hours, and the mixture filtered. The yellowish filtrate was distinctly acid and gave a copious precipitate onboiling. The proteids were separated from this filtrate in two ways:—

1. Saturation with neutral ammonium sulphate and shaking for four hours throws down all the proteids in solution; the filtrate, after saturation, giving none of the proteid tests.

2. Saturation with sodium chloride and shaking for many hours gives only a scanty precipitate, which becomes copious on adding a large excess of glacial acetic acid. All the proteids are only with difficulty precipitated by this mode of saturation, even after prolonged shaking.

Since ammonium sulphate so readily throws down all the proteids in solution, the precipitate caused by it was used in the following manner in the examination of the proteids: The precipitate was collected and dissolved by adding distilled water, and the solution dialyzed in running water (with thymol) for five to seven days.

Dialysis caused a copious precipitate, which was collected and washed with distilled water (previously boiled to remove carbon dioxide) until no proteid in solution was present in the washings. The precipitate

was then dried over sulphuric acid. The residue was in dark brown scales. It consisted of globulin with some coloring matter.

It is not possible to remove all the globulin by dialysis, so the liquid, after dialyzing for seven days, was filtered into rectified spirit, which precipitated the remaining proteids. After standing under the alcohol six to eight weeks the globulin was coagulated, and the precipitate was collected, dried, and treated with distilled water, which dissolved out a proteid. This proteid is an albumose. The chloride of sodium method may be used instead of the ammonium sulphate; it takes a longer time, but gives products freer from coloring matter.

For chemical examination, the albumose is readily prepared by boiling and filtering an aqueous infusion of the seed. The globulin is coagulated while the albumose remains in solution.

Properties of the globulin.—1. It is insoluble in distilled water, but readily soluble in 10 to 15 per cent. sodium chloride or magnesium sulphate solution; soluble to a less extent in 5 per cent. sodium chloride solution, and scarcely at all in 0·75 per cent.

2. It is completely precipitated from solution by saturation with sodium chloride after slightly acidifying, and with ammonium sulphate, whether the solution be neutral, acid, or alkaline.

3. It is coagulated by heat in 10 per cent. magnesium sulphate solution, between 75° and 80° C., the liquid being made distinctly acid; in 10 per cent. sodium chloride, between 66° and 73° C.

4. When the solution in 10 per cent. sodium chloride is placed in the incubator at 35° to 40° C., and allowed to remain twenty-four or even forty-eight hours, no precipitation occurs; a reaction in marked contrast to that given by some vegetable globulins. In its high coagulation temperature, and in its non-precipitation from solution by prolonged exposure to a moderate heat, abrus-globulin agrees with the proteid I have described in the juice of the fruit of *Carica papaya*, which, from its resemblance to serum-globulin, I have called vegetable paraglobulin.[1] The vegetable myosins occurring in the cereals, wheat, rye and barley, have a lower coagulation temperature than the paraglobulins, *viz.*, 50°–55° C., and are precipitated from solution and rendered insoluble by a prolonged exposure to a temperature of 35°–40° C.[2]

Properties of the albumose.—1. Soluble in cold or boiling distilled

[1] "Nature of Papaïn, etc.," *Jour. of Physiol.*, vol. vi., p. 353.

[2] "Physiol. Soc. Proc.," February 12, 1887.

water. Its chemical and physical properties are not apparently altered by boiling its solution.

2. It is not precipitated from solution by saturation with sodium chloride unless a large excess of glacial acetic or phosphoric acid be added. It is readily precipitated by saturation with neutral ammonium sulphate.

3. It does not form an albuminate.

4. Nitric acid does not precipitate it in a watery solution; but a precipitate falls if solid sodium chloride be added nearly to saturation.

5. Acetic acid causes a cloudiness, which is increased by potassium ferrocyanide.

6. Copper sulphate and basic acetate of lead cause precipitates, soluble in excess; mercuric chloride, a precipitate insoluble in excess.

7. Copper sulphate and potash give a pink coloration (biuret reaction).

For the albumoses occurring in the vegetable kingdom I have proposed the name *phytalbumoses*, as they differ in many respects from the animal varieties.

The phytalbumose in abrus is closely allied to Kühne and Chittenden's deutero-albumose,[1] and identical with the *a*-phytalbumose occurring in the papaw juice.[2]

There are, therefore, two proteids in the seeds of *abrus precatorius*, a vegetable paraglobulin and *a*-phytalbumose. In conjunction with Dr. Wolfenden, I am now engaged in investigating the physiological action of each of these proteids, and hope soon to publish the results. For the present it will be sufficient to call to notice the close resemblance between the proteids of the papaw juice and those of jequirity, since their physiological action appears to be in many respects similar.

Borate of ammonium.—Lashkevich (cited in *The Lancet*) has found this salt of great value in phthisis. He gives five grains three times a day, in solution, alone or with codeine, hyoscyamus, or some other sedative. The effect is to reduce the expectoration and, in some cases in the early stage, to diminish the fever. Inhalation of a spray of the solution also reduces the expectoration and alleviates irritating and painful conditions of the mouth and throat.—*N. Y. Med. Jour.*, Aug. 27.

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[1] Kühne and Chittenden, "Ueber Albumosen," *Zeitschr. für Biologie*, vol. xx.

[2] "Nature of Papaïn, etc.," *Jour. of Physiol.*, vol. vi., p. 344.

SCHWEIZER'S REAGENT AND "EAU CELESTE."[1]

By H. Baubigny.

"Eau celeste" is obtained by dissolving copper salts in ammonia, and contains salts of the type $CuSO_4,4NH_3 + H_2O$. Schweizer's reagent is prepared by treating cupric hydroxide with ammonia, and contains the base $CuO,4NH_3 + 4H_2O$, isolated by Malaguti and Sarzeau. Both solutions deposit cupric hydroxide when largely diluted. "Eau celeste," contains salts of the base which exists in the free state in Schweizer's reagent. It follows that solutions of basic cupric salts should behave as mixtures of "eau celeste" and Schweizer's reagent, and this is found to be the case. Such solutions dissolve cellulose more readily the more basic the salt. Conversely, the addition of an ammonium salt to Schweizer's reagent partially converts it into "eau celeste," and if the former has previously been saturated with cellulose, the cellulose is precipitated as the ammonium salt is added. This change is produced by ammonium carbonate and by carbonic anhydride, and it follows, therefore, that when Schweizer's reagent is exposed to the air it will form cuprammonium carbonate, and will eventually be converted into "eau celeste."

The old method of preparing Schweizer's reagent by dissolving copper in ammonia in presence of air, is defective, since it does not avoid the presence of carbonic anhydride, and hence gives a product with diminished solvent powers. Potassium sulphate and sodium chloride are not decomposed by ammonia nor by the cuprammonium base, and therefore they do not affect the properties of Schweizer's reagent. The addition of potassium or sodium hydroxide to "eau celeste" produces a liquid which is capable of dissolving cellulose.

The best method of preparing Schweizer's reagent is to precipitate a solution of copper sulphate with the calculated quantity of soda and dissolve the hydroxide in ammonia.

There can be little doubt that the Schweizer's reagent distributed over vines, as a preventative of mildew, will be rapidly transformed into "eau celeste," which is the actual preservative. The more easily p r [illegible] "eau celeste" can, therefore, be used for this purpose instead of the Schweizer's reagent.

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[1] *Compt. rend.* civ, 1616–1618.—Reprinted from *Jour. Chem. Soc.*, Sept. 1887.

"CHOLERA-RED AND PTOMAÏNES FROM GELATIN."[1]

By Dr. Brieger.

Pohl discovered, in 1886, that when sulphuric acid is added to cultures of the comma bacillus a red color is produced; a fact which may be utilized in identifying the bacillus. The coloring matter is named cholera-red, and the present communication deals with the origin of this material; the investigation being possible only after a considerable amount of the coloring matter had been obtained. The cholera-red, which may be obtained pure by recrystallization from benzol, is soluble also in ether, amylic alcohol, and chloroform. Extremely characteristic for cholera-red is its conversion into a blue coloring matter in presence of a certain definite amount of alkali, a shade of color which passes again directly into burgundy red, on the addition of a mineral acid. The blue coloring matter is readily dissolved in amylic alcohol, but on standing, changes to the original color. When the chemically pure cholera-red is distilled in a tube along with zinc dust, a white crystalline substance is sublimated over on to a part of the tube kept cold. This substance has precisely the odor of indol, and, dissolved in water, gives the characteristic red color of indol. It follows that cholera-red is a derivative of indol. Moreover cholera cultures on albuminous soils contain indol, as may be ascertained in the following manner: when these cultures are distilled over with acetic acid, and the distillate treated with fuming sulphuric acid, the nitrous indol color mentioned above as characteristic, is struck. Which derivative of indol cholera-red is will be determined when material has accumulated.

The second part of the paper concerns itself with ptomaïnes produced in gelatin by the action of bacteria. Nencki in 1876 distilled over some gelatin which had been putrified by contact with the pancreas of an ox, and obtained from the distillate by means of baryta water along with trimethylamine a ptomaïne of the composition $C_8H_{11}N$, which he held to be isophenylethylamine $C_6H_5—CH<\begin{matrix}CH_3\\NH_2\end{matrix}$. The author has obtained from putrefactive mucus neuridine $C_5H_{14}N_2$, dimethylamine $NH(CH_3)_2$ and in a very slight amount a poisonous ptomaïne whose action resembled that of muscarine. He has also

[1] *Deutsche medicinische Wochenschrift*, June 2, 1887; abstract by Jas. Niven, in *Med. Chronicle*, September.

studied the effect of human excrement on gelatin; 250 grams of gelatin mixed with a minimal quantity of excrement was examined after fifty days' standing in a moderately warm place. After evaporation to dryness with hydrochloric acid, and repeated extraction with absolute alcohol, the extract was precipitated with alcoholic solution of mercury perchloride. The precipitate boiled with water and so dissolved, was treated with sulphuretted hydrogen, filtered off from the compound of mercury and sulphur, and evaporated to dryness. The residue taken up with absolute alcohol left a substance which proved by its reactions to be identical with putrescine hydrochlorate $C_4H_{12}N_2$ 2HCl. Converted into the gold double salt it yielded the amount of gold corresponding to the putrescine-gold compound. From the alcoholic filtrate evaporated to dryness and treated with platinum perchloride there separated a crystalline platinum double salt in concentrically arranged needles. This is pretty soluble in water, and is of a straw-yellow color. It contains 37·05 per cent. Pt. The hydrochlorate obtained from the platinum salt proved itself by its reactions to be hydrochlorate of propylamine. From the same gelatin was also obtained in large amount a ptomaïne which as a platinum double salt crystallized in beautiful gold-yellow scales, and proved to be identical with gadinine previously obtained by the author from putrefying fish. The rest of the paper is occupied with the properties of this ptomaïne, which appears in animals to possess a not high degree of toxicity, though man is much more susceptible to it.

STRYCHNINE AND BRUCINE FERRO- AND FERRICYANIDES.[1]

By Holst and Beckurts.

Normal Strychnine ferrocyanide, $(C_{21}H_{22}N_2O_2)_4,H_4Fe(CN)_6 + 4H_2O$, is precipitated from neutral solutions of strychnine salts by potassium ferrocyanide, forming a white, crystalline powder with a shade of yellow, slightly soluble in cold water, more easily in hot, from which well-formed prismatic crystals separate on cooling. *Acid strychnine ferrocyanide*, $(C_{21}H_{22}N_2O_2),H_4Fe(CN)_6$, is precipitated from a strong hydrochloric acid solution of a salt by potassium ferrocyanide as a white powder with a shade of blue. It is insoluble in cold water and

[1] *Arch. Pharm.* [3], xxv, 313-315.—Reprinted from *Jour. Chem. Soc.*, Sept., 1887.

alcohol, but dissolves in hot water with formation of hydrogen ferrocyanide, giving rise to a blue coloration and the formation of hydrocyanic acid. The salt has a strong acid reaction, decomposes carbonates and is decomposed by ammonia and alkalis with separation of strychnine. *Normal brucine ferrocyanide*, $(C_{23}H_{26}N_2O_4)_4,H_4Fe(CN)_6 + 4H_2O$, is obtained by adding to a concentrated neutral brucine hydrochloride solution, a concentrated solution of potassium ferrocyanide, as tufts of yellow, prismatic crystals; it gives yellow solutions with water and alcohol. In the air it gradually passes into brucine ferricyanide with the separation of brucine. *Acid brucine ferrocyanide*, $(C_{23}H_{26}N_2O_4),H_4Fe(CN)_6$, the salt precipitated from a very concentrated strongly acid solution of brucine by potassium ferrocyanide, forms a white, crystalline powder, as seen under the microscope, which in the air quickly becomes blue. In less concentrated solutions there is no change at first, but after twelve to twenty-four hours beautiful, large, white prisms form of the same composition as the powder. The salt decomposes when heated with water with separation of hydrocyanic acid.

Potassium ferricyanide gives only normal salts. *Strychnine ferricyanide*, $(C_{21}H_{22}N_2O_2)_6,H_6Fe_2(CN)_{12}+12H_2O$, precipitated from neutral and acid solutions, forms golden-yellow, flat prisms, somewhat sparingly soluble in water to a yellow liquid. *Brucine ferricyanide*, $(C_{22}H_{26}N_2O_4)_6,H_6Fe_2(CN)_{12}+12H_2O$, is precipitated from acid or neu tral solutions of brucine salts as greenish-yellow spangles, sparingly soluble in water to a yellow liquid. Other alkaloids are now undergoing investigation by the authors.

Estimation of strychnine and brucine.—The authors have based a volumetric method on Dunstan and Short's observation that strychnine is completely precipitated from aqueous solution of its sulphate, whilst brucine is not. If a 0·5 to 1 per cent. solution of the two alkaloids, strongly acidified with hydrochloric acid, is treated with potassium ferrocyanide until a filtered portion of the solution gives a blue stain with ferric chloride paper, the whole of the strychnine is precipitated as acid strychnine ferrocyanide, whilst the brucine remains in solution. The amount of strychnine can thus be determined by using a standard solution of ferrocyanide, two hundred and forty-four parts potassium ferrocyanide corresponding to three hundred and thirty-four parts of strychnine. If the solution contain less than 0·5 per cent. the separation is too slow; also the ferric chloride paper should not

be allowed to get perfectly dry before use. A mixture containing 0·145 gram of strychnine and 0·036 gram brucine gave 0·148 gram of strychnine. To estimate the alkaloids when occurring together in, say, tinctura strychni, the total weight of the two is ascertained, then, according to Schweissinger, an excess of centinormal hydrochloric acid is added and the excess determined by centinormal soda solution. The neutral solution thus obtained is concentrated sufficiently and titrated with standard potassium ferrocyanide. A mixture containing 0·1 gram strychnine and 0·5 gram brucine gave 0·1017 of the former and 0·04915 of the latter.

SEPARATION OF THE OPIUM ALKALOIDS.[1]

By P. C. Plugge.

The six alkaloids narcotine, papaverine, narceine, thebaine, codeine, and morphine are separated by the use of the following precipitants: sodium acetate, potassium ferricyanide, sodium salicylate, potassium thiocyanate, and ammonia. The alkaloids are obtained as an aqueous solution of the hydrochlorides. The liquid is mixed with a sufficient quantity of concentrated sodium acetate solution, allowed to remain twenty-four hours, and filtered. The precipitate, washed with a little water, consists of pure narcotine and papaverine; it is dissolved in dilute hydrochloric acid and diluted until the solution contains not more than $\frac{1}{400}$ of narcotine, when a solution of potassium ferricyanide is added. After remaining twenty-four hours, filtering and washing with a little water, the precipitate of papaverine ferricyanide is obtained from which the alkaloid may be separated by digesting with aqueous soda, filtering, and if necessary dissolving and reprecipitating with ammonia. The filtrate containing the narcotine yields this alkaloid by precipitation with ammonia. The filtrate containing the remaining four alkaloids, together with an excess of sodium acetate, is concentrated to a small volume on the water-bath and allowed to remain twenty-four hours, then filtered. The precipitate washed with a little water, consists of narceine separated directly from the liquid as pure alkaloid. The filtrate contains traces of narceine and all the thebaine, codeine, and morphine. It is mixed with a sufficient quantity of sodium salicylate solution. After twenty-four hours the

[1] *Arch. Phar.* [3], xxv, 343–354.—Reprinted from *Jour. Chem. Soc.*, Sept., 1887.

crystalline precipitate is filtered and washed with a little water. It consists of thebaine salicylate. On washing this on the filter with dilute ammonia, until ferric chloride ceases to indicate salicylic acid in the washings, pure alkaloid remains on the filter. The filtrate contains traces of narceine, thebaine, the excess of sodium salicylate, and all the codeine and morphine. It is acidified with hydrochloric acid; after remaining some time the salicylic acid separated is filtered off, and the filtrate is repeatedly shaken with chloroform to remove the remainder of the salicylic acid, narceine, and thebaine; then the chloroform is removed by a gentle heat, the liquid is carefully neutralized and finally mixed with potassium thiocyanate solution. After twenty-four hours the precipitate consists of codeine hydrogen thiocyanate. The filtrate contains the morphine, which can be precipitated by slight excess of ammonia. In many cases the above methods can be employed quantitatively. Mixtures of narcotine and morphine precipitated with sodium acetate gave from 97·15 to 100 per cent. of the narcotine. Narcotine in presence of morphine, codeine, and thebaine gave 99·43 per cent. Papaverine precipitated by acetate in presence of morphine gave 98·15 per cent. of the total present. The same alkaloid in presence of morphine, codeine, and thebaine gave 97·02 per cent. In the two experiments where thebaine was present over 90 per cent. of that alkaloid was obtained by precipitating with sodium salicylate. The separation of papaverine by means of potassium ferricyanide is very complete. Codeine cannot be quantitatively separated from morphine by means of potassium thiocyanate.

AMYLENE HYDRATE, A NEW HYPNOTIC.

By Prof. J. v. Mering.

The new hypnotic which Professor v. Mering, of Strassburg, introduces to our notice (*Therap. Monat.*, July, 1887; *Med. Chronicle*, Sept.), is a tertiary amyl alcohol discovered by Wurtz. According to the *Pharm. Zeitung* (July 9th, 1887), it is prepared by heating amylene (which contains trimethyl ethylene) with sulphuric acid. Amyl-sulphuric acid is formed, and this when distilled with water is converted into the new soporific which is now known to chemists as dimethyl-ethyl-carbinol, though v. Mering has thought it well to retain the older name. Amylene hydrate is a colorless fluid boiling at 100° C., and having a specific gravity of ·81. It is soluble in

eight parts of water, and has a peculiar ethereal odor, with a slight taste of camphor and an after taste of peppermint.

v. Mering first made experiments with the drug on frogs, rabbits, and dogs. He found that in all these animals it produced a condition resembling deep sleep. After some hours they again became conscious, and seemed none the worse for taking the drug. If rendered profoundly unconscious by a large dose, they did not react to external irritation. Doses sufficient to cause deep narcotism did not affect either respiration or circulation. Very large doses arrested both, paralyzing the respiratory centre and the heart's movements. From his investigations, he concluded that amylene hydrate first affects the cerebrum, but that very large doses depress the functions of the cord and medulla.

The satisfactory results obtained from the administration of moderate doses in the lower animals led v. Mering to try it on man, and during the past two years he has given it three hundred and fifty times to sixty patients, chiefly in cases of sleeplessness, connected with nervous disorders. In doses of fifty to eighty minims, he finds it to be a useful and safe hypnotic. In about half an hour after its administration it induces sleep which lasts six or seven hours. Only in four cases was it given without avail. No excitement precedes its soporific effect and no digestive disturbance is produced by it. When a patient wakes out of sleep brought about by amylene hydrate he feels perfectly well. In only one case was some giddiness complained of.

v. Mering has given the drug to old people and also to young children. He has given it too in those suffering from cardiac weakness and in some cases of lung disease.

The new hypnotic, he finds, is intermediate in power between paraldehyde and chloral hydrate; he estimates that two grams of amylene hydrate are equal to three of paraldehyde, but only to one of chloral hydrate. It is less unpleasant than paraldehyde, for its taste is less disagreeable and it does not cause the unpleasant odor of the breath following the use of paraldehyde. Though not so powerful as chloral it is safer, since it does not depress the heart's action. Moreover, it is not followed by discomforts, which at times occur after chloral hydrate. In only one case was a little giddiness complained of after the exhibition of amylene hydrate.

Amylene hydrate then may often be given with advantage instead of

chloral hydrate and paraldehyde. In common with these drugs it has the disadvantage that its action is uncertain when pain is present.

In rabbits it is excreted in combination with glyconuric acid. In man, as in dogs also, it seems for the most part burnt up as alcohol is. v. Mering gives several forms for its administration :—

℞.	Amylene hydrate	7 gm.
	Aq. destil	60 "
	Extr. liquirit	10 "

M. D. S. Half to be taken in the evening before going to bed.

It can be given as an enema in the following form :—

℞.	Amylene hydrate	5 gm.
	Aq. destil	50 "
	Mucil. gum. acac	20 "

If pain be present it may be combined with morphine as follows :—

℞.	Amylene hydrate	6 gm.
	Morph. hydrochlor	0 02 "
	Aq. destil	60 "
	Extr. liquirit	10 "

M. D. S. Half at bed time.

The drug is also sold in capsules, each capsule containing about fifteen minims. If impure it may cause headache, vomiting, and other unpleasant consequences.

KEFIR, A NEW KOUMISS.[1]

Kefir can be made from the milk of different animals, but it is generally made from cow's milk. Fermentation is excited by the presence of the kefir, which is a species of mush-room, white when fresh, and yellow when old and dry, compact, elastic, and about one-fiftieth of an inch in diameter.

Chemically it is composed of water, fat, peptone, and nitrogenous material.

Examined microscopically it is composed of the rods and cells of beer-yeast.

It is found in the mountains of northern Caucasus near the snows. The natives believe that it is produced by the bushes which grow upon the mountain-tops. It is probable that the first origin is in the great

[1] *Le Practique Méd.*, No. 10; reprinted from *Medical News*, Aug. 27. See also Amer. Jour. Phar., 1884, p. 196, and 1886, pp. 295 and 388.

number of bacteria which circulate in the atmosphere, and whose soil of development is furnished by the curds of coagulated milk.

At the beginning of the preparation of kefir the grains should be allowed to swell in tepid water for five or six hours—two teaspoonfuls to a tablespoonful of kefir grains; they should then be washed in cold water and put in half a glass of fresh milk, which is changed every three hours. The grains, which were yellow, become white, and are then ready for the preparation of kefir.

This is done by placing the white grains in a quart of fresh cow's milk, and the whole placed in uncorked bottles and exposed to a temperature of about 45° F., and frequently shaken. The milk begins to ferment soon, and in seven or eight hours the mass is fermented. The kefir grains are removed by filtering through muslin, the liquid replaced in bottles, which are only partly filled, and carefully corked.

The milk is left at a constant temperature, and shaken every two or three hours. Fermentation continues in spite of the absence of the ferment, and in twenty-four hours the drink is ready. The grains of kefir may be washed and used indefinitely.

Kefir is richer in albumen than koumiss, less alcoholic, and less acid.

The following table of analysis shows the composition of milk, koumiss, and kefir:

	Cow's milk.	Koumiss.	Kefir.
Albumen	48	11.2	38
Butter	38	20.5	20
Sugar of milk	41	22.0	20
Lactic acid	...	11.5	9
Alcohol	...	16.5	8
Water and salts	873	918.3	905

Action of the sun's rays on glucose.—At a meeting of the French Academy of Sciences, M. Pasteur referred to some recent researches by M. Duclaux on the decomposition of sugar by the rays of the sun. This investigator had observed that when an alkaline solution of glucose, either in contact with the air or completely protected from the atmosphere, was exposed to the action of the solar rays, decomposition took place without the intervention of any ferment. Carbonic acid and alcohol were produced in just the same proportion as when sugar is fermented by yeast. This observation, although of no great practical importance, is of considerable scientific interest.—*Medical Times*, Aug. 20.

BRITISH PHARMACEUTICAL CONFERENCE.

The twenty-fourth annual meeting was commenced in Manchester, August 29th, by a reception by the President, S. R. Atkins, Esq., J. P., followed by a conversazione held in the Grand Hotel, Manchester. There was a very large and representative gathering of pharmacists, many of them accompanied by ladies, and the general approval which has again been manifested in respect to this innovation of holding a social meeting as a preliminary to the business of the Conference will doubtless secure the promotion of the experiment of the last two meetings to permanent rank. A foretaste of the executive quality of the local committee was afforded in the admirable arrangements that ensured the enjoyment and comfort of every visitor. The company listened at intervals throughout the evening to a choice selection of music, vocal and instrumental, whilst for tastes in another direction a very fine collection of microscopes and slides had been brought together, mainly, we understand, by the efforts of Dr. Thresh and Mr. J. Hart.

The Conference was held in the Chemical Lecture Theatre of Owens College, which was kindly lent for the purpose by the authorities of the college. On Tuesday morning, at about a quarter past ten, the chair was taken by the president, in the presence of a rather small attendance, which, however, rapidly increased, until the large lecture theatre was fairly full. The proceedings were commenced by Mr. G. S. Woolley, who said that in the much regretted absence of Mr. William Scott Brown, through ill-health, the duty fell upon him to welcome the Conference to Manchester on behalf of the local pharmacists. This he did in felicitous terms, and was followed by Professor Leech, who also greeted the members of the Conference on the part of the college authorities, saying that they had already shown their interest in pharmacy by establishing a complete course of pharmaceutical education in connection with Owens College. The welcome having been acknowledged by the chairman, a list of delegates from various associations to the Conference and several letters of apology for non-attendance were read.

The annual report of the executive committee was then read. A large portion of it was devoted to secretarial changes. A much smaller portion contained the important announcement that the formulary committee appointed at the last meeting of the Conference had, in conformity with the terms of its appointment, presented to the executive a "draft of what it recommends for publication as the first edition of an Unofficial Formulary." These results were now laid before the Conference, with a recommendation that the formulary committee should be re-appointed. The treasurer's financial statement showed that the members' subscriptions during the past year had amounted to £611 13s. 9d.; but that sum supplemented by the income on account of the "Year-Book" and Index, does not appear to have been nearly sufficient to maintain an equilibrium between the receipts and expenditure, and we gather from the statement that if all outstanding accounts had been paid the cash balance in favor of the Conference on June 30 last would have been about £150. The adoption of the report and financial statement was moved by the president, seconded by Mr. Kemp, and

agreed to unanimously without discussion. It is not probable that any useful purpose would have been served by an impromptu discussion of the work of the formulary committee, whilst it might have involved a considerable loss of time; but probably few who took part in the vote quite realized that they were sanctioning the publication of a draft they had not yet seen as the first edition of the Unofficial Formulary. This, however, was the subsequent ruling of the president.

Immediately after the adoption of the report the president brought before the members a suggestion that as the German Apotheker-Verein was then holding its annual meeting in Munich, a telegram of friendly congratulations from the Conference should be forwarded to that body. The suggestion was at once adopted with acclamation.

The way was now cleared for the presidential address, and that it proved to be an unusually eloquent oration will, with those who are acquainted with Mr. Atkins' powers, *va sans dire*. The dominant theme was suggested, as in innumerable other cases during the present year, by the "Jubilee." Fifty years of history in social life, in scientific progress, in craft organization! The field was not a narrow one, and time allowed only for the plucking of a handful here and there, certainly not for anything like a complete reaping. Manchester was appropriately chosen to illustrate the advance in social life. The score of express trains running daily between that city and the metropolis that have grown out of the tentative period of railway locomotion; the increase in the traffic between Liverpool and Manchester, which promises to bring to the inland city the privileges of a sea-port; the development of the industries that have made Manchester a household word througout the world; and last, but not least, the increasing love for education, literary, technical and artistic, which has culminated in the Victoria University and the Exhibition at Old Trafford; all these were briefly mentioned. The speaker next invited his audience to follow him in a brief review of the Victoria era, as it more especially affected them as pharmacists, and he chose for his first topics the half century of chemistry and botany. But it must be confessed that this portion of the review was somewhat meagre, notwithstanding that it antedated the Victoria era considerably. Such a text indeed would have sufficed for many sermons and was decidedly too unwieldy to be moulded into a division of one. The president was more fortunate when he turned to another topic, the part played by the Pharmaceutical Society of Great Britain since its establishment in 1841. "The story has been well told," he said, "but I feel deeply, and at times sorrowfully, that it has not received the recognition it deserves." Emphatically, however, he insisted that disinterestedness was the prominent characteristic of those metropolitan pharmacists who headed the new movement; possibly, had he not himself have been so intimately mixed up with its more recent history, he might have applied the same epithet to those who still lead it on. A panegyric followed of the earlier leaders—Jacob Bell, Allen, Payne, Savory, Morson, and Dinneford, not omitting the still living Thomas Hyde Hills and George Webb Sandford—and then the speaker proceeded to consider how far the ostensible objects of the organization—educa-

tion, protection of interests, and relief of distress—have been attained. The Act of 1868, it was pointed out, has rendered the examination a necessary condition of registration, and for nearly twenty years the relative proportions of examined and unexamined men have been changing. As a means of fitting candidates to pass the qualifying examination Mr. Atkins evidently looks back with regret to the time when a seven years' apprenticeship was a more important factor in the production of skilled pharmacists than now. No doubt where the master himself was competent the old-fashioned apprenticeship afforded that opportunity for acquiring practical knowledge which is an indispensible preliminary to the proper application of the theoretical. But it must be remembered that although competent pharmacists may have been more ready to undertake the responsibilities of tutor fifty years ago than they are now, such men were not by any means ubiquitous; and in those days—as indeed it is still—it was not every "chemist and druggist" who took an apprentice—and his premium—who troubled himself, or was even competent to teach pharmacy. Mr. Atkins recognizes that education continues to be the question of the hour, but he professes great confidence in the law of supply and demand; this confidence, however, did not prevent him from admitting, in the next sentence, that the voluntary principle has, in this respect proved inadequate. Much of the present want of success in the examination room is attributable, in Mr. Atkins' opinion, to the unsatisfactory condition of middle-class education in this country, an opinion in which those who know the facts best will coincide. But notwithstanding this and other drawbacks, he holds that the hope of pharmacists in the future lies in cultivating the scientific rather than the merely trading side of pharmacy, for in this direction, from the nature of things, competition will be less acute, while remuneration for service given will be on a higher scale. Turning next to the history of the Conference it was pointed out that this body exists chiefly and preeminently for the prosecution of scientific research, and this was defined as the "investigation and revelation of all the facts and phenomena of the universal nature." A big "blue-list" truly, and with a share in this wealth of subjects the Conference need never come to an end through the want of something to do. A few paragraphs were then devoted specially to the records of the past twelve months, and an eloquent peroration brought the address to a close. The burst of applause that greeted the speaker upon sitting down testified to the enjoyment which the meeting found during the delivery of the address, to which also Mr. Benger and Dr. Symes gave vocal expression in moving and seconding the vote of thanks that was unanimously accorded.

Strophanthus.—The reading of papers then commenced, the first communication read being a report by Mr. W. Elborne, on Strophanthus and Strophanthin, which was based on a research aided by a grant from the Conference, and was described as a continuation of a paper read by the author before the Pharmaceutical Society in March last. Mr. Elborne has operated on the greenish-brown variety of the seed known commercially as *S. Kombé.* The results obtained by him do not altogether correspond with those reported by other workers; for instance, the quantity of fixed oil

obtained by him from the seeds was only about two-thirds of the quantity obtained by Mr. Gerrard and Mr. Helbing. Such differences, however, he considers may be attributable to variations in the seeds operated upon. But a more important point appeared in his statement, that although in treating the seeds with absolute alcohol he obtained a larger yield of strophanthin than that reported by other observers, the seeds were still very imperfectly exhausted. He appears also to have observed some variation from the reported behavior of the glucoside with tannic acid. The author criticised Mr. Gerrard's process for the preparation of strophanthin, and suggested as an improvement either of two alternative processes, in both of which the seeds are first exhausted with water containing 10 per cent. of alcohol instead of absolute alcohol, and the use of tannic acid as a precipitant is avoided. He also suggested a modification in Professor Frazer's formula for the preparation of tincture of strophanthus. In the discussion that followed the reading of this report, Mr. Gerrard referred to the statement by Professor Frazer that strophanthin is crystallizable, and said that he also had succeeded in preparing it in the crystalline form, but the quantity was very small, and for some reason the compound rapidly decomposed. He also mentioned that in some oil from the seeds, after standing a time, he had noticed a crystalline separation, which ought to be the subject of experiment. Dr. Symes, referring to the tincture as being the preparation that would probably be used for the present, thought the preliminary treatment of the seeds with ether was hardly necessary, as proof spirit exhausted them without removing any appreciable quantity of oil. It was objected, however, by Mr. Elborne that such a preparation becomes cloudy on standing.

Catha.—Some contributions to the knowledge of catha leaves, by Professor Flückiger and Mr. T. E. Gerock, next came under the attention of the meeting. The greater part of this lengthy paper was of the historical and antiquarian nature that characterizes many of the writings of the senior author. Only the portion recording the results of the chemical examination therefore was read by Mr. Naylor. It appears that the first scientific notice of the plant was contributed rather more than a century ago by the Swedish botanist and explorer, Forskal, who reported that the Arabs ate the leaves greedily on account of their stimulating powers and the wakefulness they promoted; also that they believed the plague would not invade a place where the tree was cultivated, and that a man carrying a twig of catha in his bosom might safely go among the infected. A number of other quotations are given in the paper, tending to show that catha leaves are used by the natives of Arabia and Abyssinia in a similar manner and for a similar purpose as coca leaves in South America. The results of the chemical examination by the authors of a sample of catha are recorded in the last two or three paragraphs of the paper. About three pounds of the leaves were exhausted with water containing oxalic acid, the liquid neutralized with lime and shaken with light petroleum; the greater part of the petroleum was distilled off and the residue shaken with dilute hydrochloric acid; the acid solution was heated with lime in excess and then shaken with

ether, which on evaporation left about half a gram of a thickish oily yellowish matter that readily dissolved in acetic acid, the solution giving precipitates characteristic of alkaloids. A watery solution of the substance reddened phenolphthalein paper, but the redness quickly disappeared, in consequence, it is supposed, of the volatilization of the alkaloid, which it is proposed to call "katine." A crystalline acetate of katine was also stated to have been obtained. The authors confirmed previous statements as to the absence of caffeine.

Aconitine.—Continuing his experiments on the preparation of aconitine, Mr. John Williams has worked out a new process, a description of which he now communicated to the Conference. It consists essentially in exhausting with amyl alcohol the coarsely-ground root of *Aconitum Napellus* dried at a moderate temperature, shaking the amylic solution with dilute acid and water, and precipitating the acid liquor with sodium carbonate. The crude alkaloid is then dissolved either in ether or alcohol and allowed to crystallize. Mr. Williams especially insists upon the necessity of ensuring that the root operated upon is derived from *A. Napellus*, and he uses a fusel oil free from ordinary spirit. It will be noticed that Mr. Williams does not acidulate the percolating menstruum with tartaric or any other acid. Mr. Williams recommends that in the next edition of the pharmacopœia the alkaloid in its crystallized state should be authorized in the place of the amorphous aconitine now official. In reply to Mr. Holmes, the author said he was not quite sure as to the quality of the roots he had operated upon, as he had been dependent for his supply upon the ordinary market. But when Mr. Holmes had carried out the experiment he had undertaken on behalf of the Conference, and was in a position to supply aconite roots of undoubted botanic origin, he would be glad to repeat his experiments upon them. In reply to another question Mr. Williams said he believed the yield of crystallized aconitine by this process was larger than by any other, probably because there was not so much loss through decomposition.

The Conference then adjourned for luncheon.

Ipecacuanha.—On resuming the second sitting of the Conference was commenced by the reading of a paper on the Estimation of Emetine in Ipecacuanha, by Mr. F. Ransom. The principal novelty in this paper was the suggested use for the percolation of the root of chloroform rendered alkaline by shaking it with a strong solution of ammonia. The alkaloid is removed from the percolate by means of dilute sulphuric acid, and estimated with Mayer's reagent. The author has ascertained that contact with the ammoniated chloroform does not decompose the alkaloid. Ten samples of root tested by this process yielded proportions of emetine varying from 1·3 to 2·3 per cent., the average strength being 1·66. At the conclusion of the paper, Mr. Naylor expressed some surprise at the high results obtained by Mr. Ransom, and remarked that hitherto no published process had quite satisfied him, as they all, in his hands, had yielded varying results.

Mackay bean.—The enormous bean known as the Mackay Bean, the seed of *Entada scandens*, was the subject of the next communication, by Mr. John Moss. It consisted of an account of a chemical investigation of the

seed made with the object of isolating a poisonous principle that it was alleged to contain. No very definite result, however, has been arrived at, beyond establishing the probability of the occurrence of saponin in the acqueous extract, and the obtaining of three or four microscopic crystals, which it is hoped may be the beginning of a crop that will eventually be large enough to allow of their proper examination. Some question having been raised as to whether the substance occurring in the aqueous extract was really saponin, Mr. Holmes remarked that the root of the plant is used in the Philippines as a washing material.

Blaud's pill.—The already bulky literature on Blaud's pill next received an addition in the shape of a report by Mr. T. Maben, which may be looked upon as a kind of bye-product of the formulary committee. Mr. Maben is one of the majority who believe that the intention of the prescriber in ordering Blaud's pills, is to administer ferrous carbonate, and that the ferrous carbonate should be formed before the ingestion of the pill. Notwithstanding the authority of the Codex, Mr. Maben prefers to use the crystalline sulphate, and he trusts mainly to a coating of gelatin to prevent oxidation after the pill is made. The formula recommended by Mr. Maben is practically the same as that adopted in the Unofficial Formulary. Mr. Martindale said that Mr. Maben's formula allowed of presentable pills being prepared quickly, but they would not keep well. He expressed a preference for the iron pills of the Pharmacopœia, but it was pointed out by Dr. Symes that medical men continue to order Blaud's pills, and pharmacists have to prepare them. In reference to a suggestion by Mr. Martindale that better results were obtainable by heating the mass than by beating it, Mr. Naylor remarked that by beating he had obtained a product containing pill for pill more ferrous carbonate than the official pill.

Vesicating beetles —The next note, on "Two Species of Vesicating Beetles from South Africa," by Mr. J. O. Braithwaite, was another communication of practical value. It described the results of an examination of some "blistering flies", that had recently been consigned from South Africa. The sample consisted of two species of *Mylabris* which have been identified as *M. bifasciata* and *M. lunata*. The author reported that he had ascertained that the former of these is extremely rich in cantharidin, containing more than twice as much as *Cantharis vesicatoria*, and he suggested that as the beetle is plentiful at the Cape it might prove an economic source of the vesicant. *M. lunata* proved to be much poorer in cantharidin. After the paper had been read, Mr. Moss stated that another species of *Mylabris* is at present used as an important source of commercial cantharidin.

English-grown rhubarb.—A very brief note was then read by Mr. W. Elborne, in which he called attention to samples of English-grown roots of *Rheum officinale*, pointing out the great similarity in appearance and general characters existing between them and the dark-veined variety of the East Indian imported drug.

Oil of evodia.—The object of the next paper read, which was by Mr. H. Helbing, was to add oil of evodia to the list of deodorants of iodoform. The oil, which is derived from the fruit of the *Evodia fraxinifolia*, a ruta-

ceous plant, native of Nepal, was described as having an exceedingly agreeable and intense odor similar to bergamot. Its specific gravity does not exceed ·840, and it is soluble in ether and alcohol and has a pungent taste. The fruit on distillation yields about 4 per cent. of the oil. Some conversation arose as to a possible supply of the oil, but this was somewhat checked by the doubt expressed by the president, after examining the samples, whether the oil answered to the claim put forward on its behalf.

Cryptopine and its salts are substances not very familiar as a rule to even accomplished pharmacists, although some attention has been directed recently to the alkaloid in respect to its remarkable gelatinizing property. In the paper next read, Dr. Kauder contributed the results of his chemical experience in preparing the alkaloid and its salts. The physiological history of the compounds, however, does not seem to have been yet begun.

This brought the second sitting of the Conference and the first day's business to an end, a large number of members upon the adjournment of the meeting proceeding in carriages provided for the purpose to visit the Jubilee exhibition.

Relation of pharmacy to medicine.—The third sitting of the Conference was held on Wednesday morning, the proceedings commencing with the reading of a paper on the relation of Pharmacy to Medicine by Professor Leech, lecturer on Materia Medica in Owens College. At first it seemed as if the paper was intended as a panegyric upon wholesale-made "palatable" preparations of medicine, but after a time this found an explanation in the evident impression of the speaker that the "new commercial industries" that have arisen and "have absorbed some of the work formerly done by individual pharmacists" always result in an output of definite preparations of known composition. According to Professor Leech "the present system of education leads medical men to prefer ordering medicines which they know are made up in a palatable form to devising combinations which may not be so pleasant for their patients as they would wish;" whilst "a large proportion of those on whom powers to practice are conferred have little idea of the best methods of ordering medicines or of the physical results they may obtain by the association of the drugs they wish to give." This necessity for a devolution of responsibility however, though it may be urgent, can hardly be fairly charged against the pharmacist. We think it may be correctly asserted that it will be only necessary for the medical profession to formulate exactly what it wants to ensure a supply as far as is possible from the ordinary pharmacist, and that the difficulty is evaded rather than overcome by the prescribing of "palatable" or "convenient" preparations the exact composition of which in many cases is known only to the manufacturer. As Professor Leech's argument was developed, however, it became evident that his demand is for pure medicaments of definite or known composition, and the necessity for these he illustrated experimentally in a most interesting manner, by showing the influence of a very dilute solution of veratrine on muscle. It seems to us that a greater part of the author's argument might be appropriately addressed to the representatives of the medical profession. If it be true that "the want of reliance on the

uniformity of our official preparations is leading medical men to those large houses in America and Germany, as well as in England, who guarantee that their compounds are of a definite strength," it is desirable that the mischief should be at once brought under the notice of the medical body that at present entirely controls the formulæ of the Pharmacopœia. It is impossible, however, just now to do justice to the many points that are worthy of discussion in this most interesting address, but we shall probably refer to them when the address is published *in extenso*. Meanwhile, we entirely endorse the opinion, that "if pharmacy is to hold its own, each pharmacist must be in the future the guarantor of the purity of the medicines he dispenses, not the mere distributor."

The estimation of small quantities of salicylic acid in wines, etc., was the subject of the next paper, which was by Mr. W. H. Ince. The method preferred by the author is to distil the liquid after ascidulating it with sulphuric acid, reject the first portion passing over, then treat a definite quantity of the subsequent distillate with a 10 per cent. solution of mercuric nitrate in nitric acid or ferric chloride, and compare the liquid colorimetrically with solution of salicylic acid of known strength treated with the same reagent. The author states that he has found distillation in a current of steam "a satisfactory method of extracting a definite quantity of the acid from a definite volume of wine or similar body."

Testing and purification of hydrochlorate of cocaine.—Mr. John Williams next attempted to deal with a difficulty presented by this now widely used alkaloid. The purification process recommended by the author depends upon the almost absolute insolubility of hydrochlorate of cocaine in ether, in which cocaine itself is freely soluble, and the fact that most if not all of the impurities appear to be soluble in ether even when converted into hydrochlorate. The cocaine hydrochlorate to be examined is dissolved in the smallest quantity possible of absolute alcohol, and to this solution is added about six times its volume of pure ether; after shaking several times the mixture is allowed to stand a few minutes and the crystalline precipitate is then thrown on a calico filter, squeezed, spread on blotting paper and allowed to dry. The cocaine hydrochlorate thus purified is said to be much improved and free from the mousy odor so often complained of. In the discussion that followed the reading of the paper Mr. Christy referred to the fact that a considerable quantity of crude cocaine now received in this country from South America pays a visit to Germany for purification, and said that the publication of Mr. Williams' paper would appear to render this unnecessary in future. The question was also raised as to the preservation of cocaine in solution, and Dr. Tichborne stated that a slightly acid solution of salicylate of cocaine would keep good for twelve months.

Synthetical compounds.—Mr. Helbing next read a paper entitled Pharmaceutical Notes on some Synthetical Compounds recently introduced into Medicine. The paper was mainly a compilation of statements which have already been published in this Journal concerning the numerous organic compounds with which continental physicians and chemists have recently inundated the materia medica. It contained also some useful information

as to the best methods of dispensing some of these compounds, and as the paper was illustrated by samples of several of the substances referred to, it was much appreciated. Nevertheless, a perhaps too captious critic might suggest that it was not without objectionable features as a paper read before the Conference.

Camphor oil was next brought before the Conference in a paper by Mr. P. MacEwan, who, having examined numerous samples of the oil during the last two years, has been struck with the great range of quality they exhibited. Some were almost colorless, others very dark, and their other physical characters showed great variations. Some experiments have led him to the conclusion that high specific gravity and dark color are indicative of the absence of camphor. Mr. MacEwan considers it desirable that camphor oil should be brought to approximate uniformity before it reaches the hands of the retailer, by excluding the dark and heavy oils, bulking the remainder and submitting it to distillation to get rid of all that will distil below 170° to 175° C., which would be still useful for varnish making. Mr. Moss mentioned that in the distillation of crude oil, which is carried out to a considerable extent for the sake of the camphor it contains, a fraction is obtained resembling safrol, and he believed that a great proportion of this constituent finds its way into commerce as oil of sassafras. Another portion of the distillate, he had been informed, resembled eugenol, the heavy constituent of oil of cloves, and although occurring in small relative proportion the total yield is large, as the quantity of the oil distilled is enormous.

Some fundamental errors in the British Pharmacopœia.—Dr. C. R. C. Tichborne commenced with an admission that as a whole very few books containing so much condensed work are so free from errors as the British Pharmacopœia. The "fundamental errors" referred to and illustrated in the paper were those due to the fact that whilst the Pharmacopœia provides that all measurements shall be made at 60° F., the imperial measures used are graduated at the legal temperature of 62° F., and the metric measures are properly graduated at 39·2° F.

Another spurious cubeb was the subject of a histological paper by Mr. Kirkby. It appears to agree more closely with Flückiger and Hanbury's description of *Piper crassipes* than the false cubebs described by Mr. Kirkby in this journal, which has been referred to that species. To distinguish them, therefore, he at present speaks of the earlier one as the short-stalked variety. Mr. Holmes mentioned the interesting fact that he had recently examined a sample of cubebs of the best quality he could obtain, and that he had found it to contain the different spurious "cubebs" that have been described, and he was inclined to believe that the cubebs of the present day consist of mixtures of genuine and spurious fruits. Dr. Symes said that many samples of powdered cubebs when triturated with water showed a considerable separation of gritty and sandy matter, and one sample of powder yielded to him upon incineration as much as twelve per cent. of ash.

The chemistry of the nitrites and of nitroglycerin, by Dr. G. Armstrong Atkinson, was supplemented to one by the same author on the "Pharmacognosy of the Nitrites," that appeared last year in *Pharm. Jour.*, [3], xvii.,

1. Referring to the unsuitability of nitrous acid for medicinal use on account of its instability in contact with water, the author stated that he has found experimentally that watery solution of nitrous acid of the strength of one in one thousand, kept in a stoppered bottle half filled, is reduced in strength in a few hours to one in three thousand, the decomposition being into nitric acid, nitric oxide and water. A preparation sold as "acidum nitrosum," and sometimes used in medicine, was pronounced to be merely a solution of a variable proportion of nitrous acid in nitric acid. The only possible form in which, in the author's opinion, moderately pure nitrous acid can be conveniently exhibited as a medicine is as an aqueous solution not stronger than one in three thousand, with a little glycerin added to retard decomposition. But the free acid presents no advantages over nitrite salts, which are readily decomposed by the acid of the gastric juice, whilst the nitrites of sodium and potassium are readily soluble in water and the solutions are perfectly stable if kept free from fungoid growth; the sodium salt is, however, considered the more suitable for therapeutic use. Nitrite of ethyl, incidentally stated to be the earliest known nitrite, was next considered, especially in reference to the question whether nitric acid free or combined, occurs in it. This was answered in the affirmative, all the specimens examined having contained it, as well as old samples of spirit of nitrous ether from which all nitrite had disappeared. Nitrite of amyl, when recently prepared, has been found by the author to contain usually from seventy-five to eighty per cent. of the actual nitrite; all the samples examined contained at least traces of nitrate, and some old ones contained considerable quantities. In the latter part of the paper some points in connection with nitroglycerin were discussed, especially its qualitative and quantitative analysis. This concluded the business of the third sitting.

Morphine derivatives.—The fourth and last sitting was commenced with the reading of a paper on the Chemistry and Pharmacology of some of the Morphine Derivatives, by Messrs. Dott and Stockman, which, although containing a record of much valuable and interesting work, hardly lends itself to intelligible condensation. The first compound dealt with was methylmorphine, or codeine, and it was stated that the alkaloid artificially prepared from morphine, and which has been already shown to correspond with codeine from opium in chemical and physical properties, agrees with it also in physiological action. In dimethylmorphine the chemical change is attended by a complete modification of the symptoms characteristic of the morphine group. Ethylmorphine does not differ essentially in physiological action from the corresponding methyl base, codeine; but the introduction of the acetyl group slightly increases the narcotic and tetanizing action.

Pharmacy of logwood, by Mr. Louis Siebold. The object of this note was to deal with the questions: What is the best logwood for use in pharmacy? What is the nature and condition in which this wood is intended by the authors of the Pharmacopœia to be employed? Are these intentions fulfilled in practice? In reference to the first question the author thought that Campeachy or Honduras was much more suitable for use than the inferior

kinds obtained from San Domingo and Jamaica. As to the condition in which the wood was to be used the Pharmacopœia was silent, and ignored the fact that the wood in logs and that ordinarily sold in chips or in the form of a coarse powder, were most essentially different from each other from a chemical point of view, since the ground wood or chips as met with in commerce had undergone a long process of fermentation by being laid up with water in heaps and exposed to the air for weeks. The great difference between the two was well known to those engaged in dyeing and calico-printing, and to technical chemists acquainted with these processes; but it was little known to and not at all appreciated by pharmacists. The author fully explained the difference in the chemical nature of the two woods, and expressed the opinion that the fresh or unfermented wood ought only to be used in pharmacy, the aged or fermented wood being very unsuitable for the decoction and the extract, especially for the latter, both from a pharmaceutical and from a medical point of view. He had no doubt in his mind that the framers of the Pharmacopœia meant the unfermented wood, as this alone had the sweetish taste alluded to in the characters. The last question he answered in the negative, asserting that fermented chips were almost exclusively used by pharmacists and wholesale houses for the B. P. preparations. Unfermented chips were rarely met with in commerce, and, to his knowledge, were never sold to retailers. He thought that pharmacists or wholesale druggists should prepare their own extract, as that imported so largely from France and America was not pure enough for pharmaceutical purposes. He would recommend in the place of the extract a liquor hæmatoxyli, representing its own weight of wood, which after settling was an elegant and very permanent preparation. He gave full details as to how this should be made.

Logwood as a reagent.—Mr. Siebold also read a Note on the Application of Dyewoods in Chemical Analysis. He said that much had been written regarding the application of logwood tincture for the detection of alum in bread and of traces of heavy metals in potable water; but it had never been properly pointed out what kind of logwood should be employed for such purposes. He recommended the use of aged or fermented wood for the preparation of the tincture intended for testing, since its indications were far more delicate. He showed experimentally how this test could be made to show the presence of one part of copper in four millions, one of aluminium in seventeen millions, and one of tin in the same proportion of water; also, how it should be best applied for the detection of alum in flour and bread He also warmly recommended the fustic test described by Goppelsroeder for the detection of traces of aluminium in colorless liquids.

Examination of cacao butter, by Mr. E. J. Millard. This paper at first dealt with the statement in the British Pharmacopœia that the melting point occurs "usually between 30° and 35° C.," the author affirming that starting with an original sample of pure cacao butter, the melting point of which was 33° C., he had found that the addition of as much as ten per cent. of paraffin, wax or tallow, only varied the melting points slightly outside the limits officially given as "usual." Better results were obtained with the test given in the

United States Pharmacopœia, which depends upon the behavior of the fat dissolved in ether and submitted to different degrees of temperature. Eighteen commercial samples were examined according to this test and only two came under even the shadow of suspicion.

Quinological work in the Madras cinchona plantations.—Mr. David Hooper supplied another convenient summary of results obtained in further experiments carried out by him in his capacity of quinologist to the Madras government. The first series of twelve analyses referred to, showed that bark from trees of the same age and growing in the same situation might vary in alkaloidal strength, the figures ranging from 1·75 per cent. to 3·90 per cent. of quinine, and from none to 0·16 per cent. of quinidine. It also seems probable that there is no advantage in raising only one stem from a coppiced tree. Bark from the same twelve trees, examined in each consecutive month, showed that in the six months next following the original stripping there was a decrease of alkaloids in the bark left, as if the tree had suffered in this respect from the shock of the operation; but in the seventh month recovery had well set in, and by the twelfth the bark was richer than it had been a year before. Incidentally, it was also observed that March is the month in which cinchona bark appears to be richest in alkaloids. Some further experiments as to the effect of manuring cinchona trees, seem to show that bone manure and cattle manure are best suited for the purpose, though the improvement of the bark in quinine was in no case more than 14·58 per cent. Another experiment as to the extent to which renewal of bark can be profitably carried appears to show that the maximum in the case of a hybrid Ledger plant had been reached with the third year's renewal, although the fourth renewal still resulted in a rich bark.

Crude carbolic acid and its substitutes.—Mr. A. H. Allen commenced by referring to the elastic manner in which titles suggestive of carbolic acid are frequently applied to preparations from which that substance is entirely absent. But the evident object of the paper was to bring under the notice of the Conference a product that is now obtained in enormous quantities in the condensation of the waste gases from blast furnaces consuming bituminous coal, which, according to the author, consists of phenoloid bodies resembling more closely the creosotic products from wood tar than the coal tar acids. This product, for which the commercial name of "neosote" has been adopted, was described and exhibited.

The president then in appreciatory terms referred to the work done by the Unofficial Formulary Committee, especially referring to the services rendered by the chairman, Mr. W. Martindale, and the secretary, Mr. W. A. H. Naylor. He concluded by moving the reappointment of the committee. The motion was seconded by Mr. J. Williams and agreed to unanimously.

The presentation of the gift of books provided by the Bell and Hills fund, was then made by the president, and acknowledged by Mr. Wilkinson, as vice-president of the local association.

The president announced that, following the usual custom, the Conference would meet next year in the same place as the British Association, and that would be the city of Bath.

The election of officers for the ensuing year then took place by the tendering of a single vote for the list proposed by the Executive Committee, which was as follows:—

President,—Mr. F. B. Benger.

Vice-Presidents.—Messrs. M. Carteighe, C. Symes, S. Plowman and W. Martindale.

Treasurer.—Mr. C. Umney.

Honorary General Secretaries.—Dr. J. C. Thresh and Mr. W. A. H. Naylor.

Committee.—Messrs. W. Allen (Dublin), M. Conroy (Liverpool), R. H. Davies (London), D. B. Dott (Edinburgh), A. W. Gerrard (London), T. Maben (Hawick), N. H. Martin (Newcastle), F. Ransom (Hitchin), and G. S. Woolley (Manchester).

Auditors.—Messrs. W. Wilkinson (Manchester), and E. J. Appleby (Bath).

A vote of thanks to the local committee, and especially to Messrs. Woolley, Benger, Hart, Kemp and Wilkinson, for the manner in which they had carried out the arrangements, was moved by Mr. Schacht, seconded by Mr. Martindale, and carried by acclamation. It was acknowledged by Mr. Wooley, Mr. Benger and Mr. Wilkinson. This was followed by a hearty vote of thanks to the authorities of Owens College, which was moved by Mr. R. Reynolds, and seconded by Mr. D. B. Dott. Still another vote of thanks was accorded to the executive committee of the Jubilee Exhibition for its courtesy in inviting the members of the Conference to be present at a conversazione.

The proceedings terminated with a hearty vote of thanks to Mr. S. R. Atkins for the admirable way in which, as president, he had conducted the business of the meeting. This was moved by Mr. Conroy and seconded by Mr. Balkwill, and after having been carried with great applause, was acknowledged in suitable terms. This brought to a close the business of one of the most successful meetings of the Conference, which was also the most numerously attended, the number signing the attendance book having been two hundred and forty-nine.

Early on Thursday morning the weather was fine enough to have made the excursion to Matlock Bath a perfect success if it could have been trusted to continue throughout the day; but even before the time appointed for meeting at the Central Railway station, heavy threatening clouds obscured the sun, and made the prospect less encouraging. Nevertheless, a large proportion of the Conference visitors gathered together and took their places in the special train, provided for conveying them to Matlock, where the programme which had been arranged for their entertainment, was carried out very successfully, notwithstanding some sharp showers of rain.—*Phar. Jour. and Trans.*, September 3, 1887.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The thirty-fifth annual meeting convened for the first time on a Monday, all the previous meetings having been held on Tuesdays, with the exception of three or four, which commenced on Wednesdays. Under the by-laws the Council is required to meet on the day preceding that fixed for the assembling of the Association, and in accordance with this provision a session was held during Sunday evening, September 4, at the Grand Hotel in the city of Cincinnati, and another session on the following morning.

The "Odeon" had been selected by the Local Secretary, G. W. Voss, and the local Committee of Arrangements, and proved to be well adapted for the purpose. Located on a principal thoroughfare, but a short distance back from the street line, the noise of passing vehicles was inaudible in the hall, and could not interfere with the deliberations, and while the hall is spacious enough to have accommodated a much larger audience, the means of access o the seats are so numerous and convenient that visitors could enter or depart without disturbing the discussions; moreover, with little effort on the part of the speakers they could be easily heard by all present.

When the meeting assembled shortly after three o'clock, the first Vice-President, Dr. H. J. Menninger occupied the chair, in the absence of President Tufts, and introduced Hon. A. Smith, Mayor of Cincinnati, who bid the Association a hearty welcome, and expressed the wish that the meeting would prove a benefit both socially and intellectually. In replying the vice-president referred to the fact that this was the third meeting held by the Association in Cincinnati during thirty-two years. Subsequently he read an address which had been prepared within the short time since notice had been received of the inability of the president to be present at this meeting. It was mainly devoted to the labors of the Committee on Management by whom a plan would be presented, alloting specified time for the consideration of the several subjects which naturally should engage the attention of the Association, as had already been contemplated at the organization in 1852, when an elaborate report by Wm. Procter, Jr., Sam. M. Colcord and Geo. W. Coggeshall had been presented, which outlined the scope of the proposed organization, as was shown by several appropriate quotations. The vice-president also alluded to the condition of the treasury, which not many years ago was almost empty, but at present shows an available balance of nearly $12,000. "This meeting will, I hope," said the vice-president in conclusion, "by the adoption of the plan presented by the Committee on Management, be the beginning of a new era of prosperity and usefulness. While these recommendations of the committee are being discussed, let me hope that opposing views will be advocated in the true spirit of the educated man, and that the judgment which you will render may illustrate your temper at the time that it was done, with malice toward none and with charity toward all."

The Secretary of Council read the names of thirty-one candidates for membership, after which the reports of standing and special committees were read by title, and the report on credentials was read in full, showing

that delegates had been accredited from the following colleges of pharmacy: Chicago, Cincinnati, Cleveland, Louisville, Maryland, Massachusetts, National (Washington, D. C.), New York, Philadelphia, Pittsburg and St. Louis; from the State Pharmaceutical Association of Alabama, Arkansas, Connecticut, Florida, Illinois, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, Wisconsin, and the Province of Quebec; from the county or city associations of Kings county, N. Y., Berrien county, Mich., Detroit and Nashville, and from the alumni associations of the colleges of Chicago, Cincinnati, Louisville, New York, Philadelphia, St. Louis, and the University of Michigan. At subsequent sessions several additional credentials were presented.

The Nominating Committee was then appointed by the selection of one member of each delegation from colleges of pharmacy and state associations, and the committee was authorized to receive the representatives of other delegations from such bodies who may arrive in time for participating in the labors of the committee. The following non-delegates were appointed by the chair; J. P. Remington, of Pennsylvania, Leo Eliel, of Indiana, John Weir, of Ohio, G. H. Schafer, of Iowa, and D. S. Carraway, of Tennessee.

The minutes of the Council since the last annual meeting were read by the secretary, and were on motion approved. In this connection the various reports spread upon the Council minutes were read, among them a very thorough one by the Auditing Committee Jos. L. Lemberger, Henry Canning and Linus D. Drury, who had closed the books of the former treasurer preceding their being turned over to the new treasurer. The committee had found numerous discrepancies in the accounts, leaving a balance of $2195 due to the Association from the former treasurer. The present treasurer subsequently reported that this balance had been paid over to him in full. The committee's report had been printed by order of the Council, and copies of it were distributed to the members present.

The three members of the Auditing Committee, having performed the tedious labor assigned to them, without asking any recompense therefor were elected life members by the Council, who ordered that the requisite sum for this purpose, $120, be transferred from the general to the permanent fund.

The Council had also instructed the treasurer to arrange with a reliable insurance company for a bond by $5000—which sum was subsequently increased to $10,000 by the association. It had also been decided to publish annually in the Proceedings a complete list of all dues received by the treasurer during the preceding year. Three members, who had waved their right to life membership under the old constitution, were made life members, old style, without claim to the Proceedings.

The last Auditing Committee's report showed the total receipts of the treasurer up to July 1st, to have been $13,276.14, and the expenditures $8,556.70, leaving a balance in bank at the date named of $4,719.44. The investments were reported as follows: Ebert fund $600—; Centennial fund $1100—;

Life-membership fund $3700—; but the market value of each $100 bond was $128.25. In addition to the bonds a small cash balance remains in a saving bank to the credit of each fund. The association subsequently directed $4000 to be transferred from the general fund for permanent investment, to the life-membership fund.

The report of the Committee on Management, contemplating numerous changes in the by-laws. was read at the first session, and then laid over for further consideration; it was printed for the information of the members present.

The second session was held on Tuesday morning, and after a recess, continued in the afternoon of September 6. A partial report was presented by the Nominating Committee, and the following officers were duly elected:

President. John U. Lloyd, Cincinnati.

Vice-presidents. M. W. Alexander, St. Louis; A. K. Finlay, New Orleans, and Karl Simmon, St. Paul.

Treasurer. S. A. D. Sheppard, Boston.

Permanent Secretary, John M. Maisch, Philadelphia.

Reporter on Progress of Pharmacy, C. L. Diehl, Louisville.

After the installation of the officers, the reports of Standing Committees on Legislation and on Prize Essays were read, the latter recommending the Ebert prize to be awarded to Professor Emlen Painter for his essay on spirit of nitrous ether read last year; the recommendation was adopted.

Messrs. MacMahan, Sloan, Baker, Good and Fennel were appointed a committee to report on the time and place of the next annual meeting. Subsequently Detroit was recommended and after much discussion, this recommendation was adopted, the Council being requested to appoint the time.

Reports were also presented from the Committees to visit the National Wholesale Drug Association; on the introduction of foreign medicinal plants; on national formulary of unofficinal preparations; and on resolutions presented to the American Medical Association.

The recommendations of the Committee on Management were next considered seriatim and adopted with little or no alteration. Considerable discussion was occasioned on the manner of constituting the nominating committee. A proposition was made to have the members of this committee appointed by the State Associations only, ignoring the colleges of pharmacy, by whom the Association itself was organized. Other propositions favored the nominations being made in the open meeting, or the returning to the practice abandoned in 1885, to give to each association of pharmacists a representation on the nominating committee. Finally it was agreed that no association should have the right to make these appointments, but that each State shall be represented on that committee by two members; the manner in which these representatives are to be selected was not stipulated, but it is evident that the plan adopted is in all its essential features the same as the one proposed by the Squibb in 1880, which had the additional advantage of providing for the manner in which the selection was to be made. Under the new plan a State, (or territory or province), will be entitled to

representation on the Nominating Committee, although there may be no local pharmaceutical association in the State.

The main features of the new arrangement which went into effect at once, may be stated as follows: Two sessions at the beginning and the terminal session of each annual meeting are to be devoted to routine work and to general business. All other subjects are to be brought up before meetings specially arranged for this purpose. With this end in view four sections have been created, on commercial interests, on scientific papers, on pharmaceutical education, and on pharmaceutical legislation. Each section elects its own chairman, secretary and committee the latter to prepare business for the coming year. No money can be appropriated by any section, unless approved by the Association in general session. For the present two sessions are to be devoted to commercial interests, three to scientific discussions, and one each to education and legislation, the last two sections to meet successively, or, in case of necessity, simultaneously. A member of the Association may participate in the deliberations of any one or all of the sections.

An effort was made to amend the by-laws so as to allow any one of them to be suspended by a vote of three-fourths of the members present, but the Association very wisely rejected this proposition, which might have opened the door again for confusion similar to that noticed at the meetings for some years past, and which the various measures adopted of late years were unable to prevent. With the prospect of securing better work in the future in consequence of this separation of the labor into distinct portions to be attended to at specified times, the Association passed, unanimously, a hearty vote of thanks to the committee that had elaborated the plan.

The report of the Committee on National Formulary was next taken up, and the various recommendations were considered and adopted with some modifications. The work will be stereotyped and printed as part of the Proceedings, and in addition to this a separate copy of the formulary will be furnished to each member. The question of copyrighting the work was referred to the Council, and this body resolved that the work be copyrighted, but that the reprinting of any or all of the formulas, in an unmutilated condition, be not prevented.

Preceding each session of the sections no general business can be transacted, under the new rules, except election of members.

The Section on Commercial Interests held two sessions on Wednesday forenoon, and organized by the election of A. H. Hollister, of Wisconsin, chairman, and J. W. Colcord, of Massachusetts, secretary. The Committee on Commercial Interests was completed by the election of E. A. Sayre, of New Jersey; W. H. Rogers, of New York, and A. K. Finlay, of Louisiana.

A resolution was offered by M. Hallberg, and referred to the committee for report next year, requesting manufacturers and dealers to label their products in conformity with the official nomenclature, and to designate strengths by the specific gravity or percentage strength, thus abolishing arbitrary signs and obsolete standards, such as "F" marks and degrees Baumé.

The removal of the special tax on druggists for selling alcoholic liquids,

and the abolishing of the revenue tax on alcohol to be used for manufacturing purposes, were subjects creating much discussion. A motion was made by Mr. Canning and amended by Mr. Schafer, that the Committee on Commercial Interests be instructed to confer with the National Wholesale Drug Association and the various State associations with reference to memorializing Congress to remove the twenty-five dollar internal revenue license on alcohol when sold by pharmacists for the actual necessities of medicine.

An amendment was offered by Mr. W. S. Thompson, that Congress be requested to abolish the special license tax on alcohol. After further discussion the amendment was accepted by a vote of 37 ayes to 22 nayes, and the amended motion was then adopted.

The *Section on Scientific Papers* held three sessions on Wednesday afternoon and Thursday, and organized by the election of T. Roberts Baker, of Virginia, as chairman; A. B. Lyons, of Michigan, as secretary, and J. M. Good, of Missouri, as third member of the committee.

Vanillin and Extract of Vanilla was the subject of the first paper read by Clay W. Holmes. Solutions of vanillin of European and American manufacture were made, also of coumarin, and compared with an extract of vanilla of the customary strength, one ounce to one pound. It was ascertained that vanillin will produce an artificial extract resembling that of vanilla, but not of the strength indicated by the manufacturers. However, since the vanillin of commerce is an artificial product, not prepared from vanilla, the author thinks that its solution should be sold under its proper name, and he states that a dealer selling it in the State of New York as extract of vanilla would be violating the adulteration of food law. During the discussion which followed, it was stated that one ounce of vanillin may be regarded as producing an equally strong flavor as one pound of vanilla, but that the former was accompanied by a foreign odor which cannot well be described, but was called "pine-odor."

Fluid Extract of Liquorice-root, by G. W. Kennedy. For sixteen troyounces of liquorice-root a menstruum is recommended, consisting in the beginning of a mixture of alcohol, five fluidounces, glycerin, three fluidounces, water, seven, and ammonia water, 1 fluidounce; the percolation is finished with diluted alcohol; the first twelve fluidounces of percolate are reserved, the weaker percolate evaporated to four fluidounces, and this is mixed with the reserved portion. It is claimed that the above amount of ammonia is sufficient to prevent precipitation of glycyrrhizin, and that the addition of glycerin improves the appearance of the fluid-extract and contributes to its permanence.

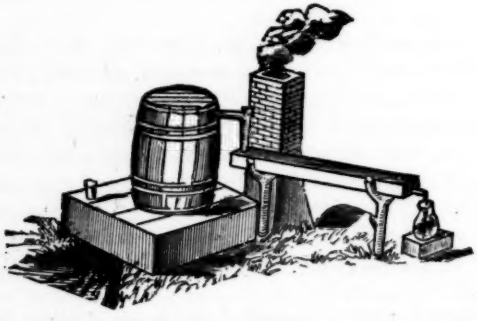
Prof. Diehl stated that the amount of ammonia directed by the pharmacopœia was about correct for the pharmacopœial process, the excess being volatilized in evaporating the weak percolate. Mr. Ebert had observed that a much better fluid-extract of liquorice-root is obtained if heat be avoided; for the flavoring of tobacco a serviceable extract had been prepared by the use of lime-water, which was considered much superior to that made with ammonia. Prof. Lloyd had observed that different samples of liquorice-root required different amounts of ammonia. Prof. Remington called atten-

tion to the change in the menstruum of the completed preparation, as proposed by Mr. Kennedy, which would induce precipitation. That the pharmacopœial fluid-extract is not clear was stated by Mr. Klie, who favored making this preparation by repercolation.

Reference was also made to wild liquorice-root of the southern States, which is used in some places to a considerable extent, and is said to be very similar to the officinal drug; it is probably obtained from *Glycyrrhiza lepidota*, and an investigation of the subject was promised by Mr. Carraway.

Liquor Gutta-perchæ was the title of the third paper read by Professor Good, in which he recommended in the place of the pharmacopœial process, to dissolve four parts of select gutta-percha in ninety-six parts of chloroform and filter the solution through patent textile filtering paper; a solution containing five per cent. of gutta-percha may be readily filtered. By the use of dentists' white purified gutta-percha filtration would be avoided; but this article is sold at $1 per ounce, while good gutta-percha can be purchased for $2, and traumaticin for $2.75 per pound. Prof. Painter stated that a solution of gutta-percha in commercial benzol readily deposits the impurities contained in the former, thereby becoming perfectly transparent; this may be employed, or the dissolved portion may be easily obtained by evaporation.

Agents for Making Hydro-alcoholic or Aqueous Solutions of Volatile Oils, by Prof. C. O. Curtman. Talcum, purified by boiling with dilute hydrochloric acid and washing with water, was found to be the best material for preparing medicated waters and allied solutions of volatile oils; next comes "kieselguhr," which, however, requires to be employed in somewhat larger quantities; and nearly equal to this is the Richmond diatomaceous earth, while calcium phosphate is not eligible. A lengthy discussion followed the read-



ing of this paper, with reference to the use of magnesium carbonate, calcium phosphate, glass-wool, paper-pulp, and other materials recommended for dividing the volatile oil, and of hot water for dissolving the latter. The advantages and disadvantages of distillation were likewise discussed.

The fifth paper, by C. K. Gallagher, of Washington, N. C., illustrated an apparatus used in the southern States during the civil war for the manufacture of *saltpetre* for ammunition, and one for making *alcohol* for hospital

use. The third apparatus figured shows the crude stills in use in North Carolina for the distillation of the *volatile oils* of sassafras, pennyroyal, peppermint, etc., as follows:

A trench is dug in the ground, ending in a chimney. A box with sheet-iron bottom, closed top, and auger hole to introduce water in the top, is surmounted by a barrel, which is connected (by an elbow of wood, bored out with an auger) to a tin pipe lying in a trough of cold water, which is the condenser. The outfit costs about $10. The sassafras roots are dug, washed, bruised and chopped into short pieces and placed in the barrel. Water is introduced into the steamer or box, all the joints luted tight with clay and fire applied in the trench. The steam passes through auger holes in top of box and bottom of barrel, and is condensed and passes into the receiver with a portion of oil, which is decanted from above, or the water drawn off below.

Mr. Luhn had sent various specimens of sand, which was brought to the surface of the earth during the great earthquake in South Carolina in August 1886; these were exhibited by Mr. Painter.

Two elaborate papers on volatile oils, by Ed. Kremers, of Wisconsin, were presented, and of each a synopsis was read. *Oil of Pennyroyal* (hedeoma) was found to contain an alcohol, boiling in the neighborhood of 70° C., but as obtained from two different samples of oil, the ultimate composition and the boiling point varied to some extent. A body named *hedeomol* has the composition $C_{10}H_{18}O$, and exists in two modifications, boiling near 170° and 208° C., the former having an odor somewhat resembling lavender, while the odor of the latter is mint-like, recalling that of pennyroyal. On saponification of the oil, formic, acetic and isoheptoic acids were obtained.

Oil of Citronella (Andryopogon Nardus, *Lin.*) yielded a heptoic aldehyd $C_7H_{14}O$; a terpene $C_{10}H_{16}$; citronellol $C_{10}H_{18}O$, and acetic and valerianic acids.

Irish-moss Gelatin was the title of a paper read by Prof. Painter, and a number of samples were exhibited. A strong solution of the gelatinous principle of Irish-moss may be made by suspending the washed drug enclosed in a conical bag in a percolator containing water, and heating this by means of a water-jacket to the boiling temperature for about two hours; the thick mucilaginous liquid is then drawn off, and may be evaporated to dryness by placing it in shallow trays in a well-heated drying closet. The yield of gelatin is about 70 per cent., the Irish-moss not being completely exhausted. As an example for the manner in which it may be used for emulsions, the following is given:

Emulsion of Cod-Liver Oil. Dissolve Irish moss gelatin, 40 gr., in boiling water, 5 fluidounces, transfer the solution to a pint bottle, add cod liver oil, 8 fluidounces, in divided portions, shaking vigorously after each addition until a perfect emulsion is formed; then add syrup of tolu, 2 fluidounces, and lastly a solution of oil of sassafras 10 minims, oil of wintergreen 10 minims, and oil of bitter almond 2 minims, in alcohol 1 fluidounce; shake well together. The emulsion may also be made in a mortar in the usual way.

Pharmacist and Manufacturer was the subject discussed in a paper by Prof. Lloyd. The relations between the two are of such a nature that it is not easy to give a synopsis of the paper in a few lines. The advantages and disadvantages of each, in manipulating upon small and large quantities, were reviewed, and it was argued that the manufacturer should aim at producing preparations equal to those made by the skillful pharmacist, but that the latter should endeavor to make most, if not all, the pharmacopœial preparations. A lengthy discussion followed, in which among other things, the practice prevailing to some extent, of making tinctures from commercial fluid-extracts was criticized, and the abolishment by the pharmacopœia of fluid-extracts was advocated, the latter to be replaced by fifty-per-cent. tinctures, which would ultimately take the place of the stronger and the weaker preparations, and in their manufacture did not require the use of heat.

The Medicines of Medicine was the somewhat ambiguous title of a paper read by Prof. Painter, referring to the numerous proprietory articles prescribed by physicians, a practice which should be condemned for professional and scientific reasons; but unfortunately, a practical remedy for the evil was not suggested. A motion to publish this paper for general distribution to physicians, was tabled.

Weights and Measures, by Alfred B. Taylor. To this subject the author has given a great deal of attention, and has heretofore written several elaborate essays in relation to the various systems in use. He is an advocate of the octonary system of numeration, and presents his views in a clear and forcible manner. The paper, very naturally, elicited discussion on the decimal system and on the pharmacopœial system for stating quantities. In relation to the latter Mr. Hallberg offered a resolution from the Illinois Pharmaceutical Association, that in the next revision of the U. S. P. the parts-by-weight system be replaced by the weight-and-volume system; that the decimal proportion be retained so as to harmonize with the metric system, and that relative quantities be also expressed in corresponding Troy weight and U. S. wine measure. The resolution was referred to the Committee on the Pharmacopœia.

Three papers were presented by Joseph Feil of Cleveland, on *Ground Ointment Medicaments*, in which the recommendation is renewed to prepare ointments by the use of a paint mill; on *Bismuth and Potassium Citrate*, which is proposed to be prepared from two parts of bismuth citrate and five parts of potassium citrate, the two yielding a clear solution; and on *Solixirs*, which term is proposed for rather concentrated solutions of medicaments, which are to be converted into elixirs by the addition of simple elixir. The formulas given yield solutions in alcohol, or in water and glycerin.

The Percentage of Ethyl-nitrite in Washed Nitrous Ether, by W. Simonson, was the last paper presented. It gives a large number of assays, showing the variation in strength, if made by the same process at different times, and it is suggested that in preparing spirit of nitrous ether it be assayed to determine its strength, or that it be made from the pure ether by dilution.

A letter from Mr. J. B. Bond of Little Rock, Arkansas, was read, urging the use of measures of capacity for liquids.

A special report of the Committee on Publication, referred by Council to this section, was read. It was in reference to a proposition made the year before that papers be printed for the use of the members present. The report was in opposition to this plan, but favored the printing of a synopsis of each paper, this being regarded as sufficient to enable the listener to intelligently discuss a paper which he may have heard read. The section, however, favored the printing of the papers by the Association's printer in the type in which they are to appear in the Proceedings, and the Association subsequently ordered that arrangements be made to that effect by the Permanent Secretary.

The Section on Pharmaceutical Education was organized by the election of Professor J. F. Judge, of Cincinnati, chairman; Professor H. M. Whelpley, of St. Louis, secretary, and Professor P. W. Bedford, of New York, as the third member of the Educational Committee. No further business was transacted before the Section adjourned.

The Section on Pharmaceutical Legislation was organized by the election of Dr. R. F. Bryant, of Kansas, chairman; Wm. P. DeForest, of Brooklyn, secretary, and John M. Maisch, of Philadelphia, as the third member of the committee.

On motion of Mr. Day, a committee of five was appointed to devise a plan, if the same be feasible, for the interchange of certificates by State Boards of Pharmacy. The chair subsequently appointed Messrs Day, of Illinois; Nicot, of New York; Hatton, of Ohio; Schafer, of Iowa, and McDonald, of Michigan.

As subjects for discussion at the meeting next year Mr. Day proposed: "Should the Diplomas of Colleges of Pharmacy entitle Holders to Registration without Examination?" and Mr. Hallberg offered "An Outline of a Pharmacy Law Embodying All Desirable Features."

The session of the Section was attended by representatives of eight State Boards and two County Boards of Pharmacy.

The *Ninth Session* of the Association convened on Friday morning, September 9th, when after routine business, the introductory to the report on the progress of pharmacy, and the report on the drug market were read. A motion that in the latter report the names of drugs be changed in accordance with pharmacopœial nomenclature, was lost, after several speakers had expressed their preference for following commercial usage in a report pertaining to commercial matters.

A motion inviting female pharmacists to join was tabled as being unnecessary, since the Association had elected ladies as members some years ago.

A supplementary report from the Nominating Committee was received, naming three members of Council, and Mr. James Vernor, of Detroit, Local Secretary. The nominees were elected, and Mr. Vernor was also made chairman of the Committee on Arrangements.

Various telegrams and invitations were received and acknowledged. The delegates from the National Wholesale Drug Association who were present, addressed the meeting, and a committee was appointed to visit that association at its next meeting.

On motion of Mr. Seabury three prizes of $75, $50 and $25, were offered for competition to the most practical papers presented next year in the Scientific Section; and on motion of Mr. Macmahan, $50 were voted to the Committee on Commercial Interests for a prize or prizes in connection with the exhibition intended to be held next year.

On motion of Mr. Klie, copies of the Proceedings were ordered hereafter to be sent to the State Associations.

The sum of $75 was placed to the use of the Formulary Committee for necessary expenses. The Management Committee was reappointed for the next year for presenting such recommendations as may be deemed necessary for the perfection of the recently adopted course in conducting the business at the meetings; and the Committee on Commercial Interests was instructed to confer with the National Wholesale Drug Association in regard to mutual fire insurance.

In addition to papers to be read at the annual meetings, also reports of committees and officers of the Association are to be printed, if feasable, for the use of members at the annual meetings, but no journal or other publication is to be allowed access to these documents in advance of the meeting.

The Council reported its organization as follows: W. H. Rogers, chairman; Karl Simmon, vice chairman; G. W. Kennedy, secretary; chairman of Committee on membership, G. W. Kennedy; on Finance, M. W. Alexander, and on Publication, C. L. Diehl.

Resolutions of thanks were passed, and after reading of the minutes the Association adjourned to meet next year in Detroit, at a time to be fixed by the Council.

During the sessions seventy new members joined the Association by election or as delegates, and by paying the customary fee. In addition 444 persons were, upon the recommendation of two or more members, invited to join, and they will become members by paying the dues and filing their signatures to the constitution and by-laws of the Association.

A number of members arrived in Cincinnati on Saturday and Sunday preceeding the first session, and were hospitably entertained by the local pharmacists. The entertainments projected by the Arrangement Committee, consisted of a reception and promenade concert at the Grand Hotel on Tuesday evening, and an instrumental and vocal concert at Music Hall on Wednesday evening. On Thursday evening the members enjoyed the splendor of the grand spectacular drama, "Rome under Nero," with its vast arena, chariot races, combats, processions, etc., terminating with the conflagration of the Eternal City. On Friday afternoon a large number of carriages conveyed the members to various places of interest in the beautiful suburbs of Cincinnati, this portion of the programme terminating with a visit to the Zoological Garden, where dinner was served for the entire party. The visiting ladies were most of the time taken care of by the Local Ladies' Committee, Mrs. J. D. Wells, chairman, who with her efficient associates left nothing undone to make the stay of the visitors both profitable and enjoyable. That besides the entertainments provided by the official programme of the Arrangement Committee numerous visits were made to

localities and to establishments, and that occasional impromptu meetings for social intercourse were arranged and successfully carried out, need scarcely be stated in view of the well-known generous hospitality of the citizens of Cincinnati in general, and of the Cincinnati pharmacists in particular.

MINUTES OF COLLEGE MEETING.

PHILADELPHIA, September 26th, 1887.

A stated meeting of the members of the College was held in the hall this day, Robert Shoemaker, presiding. Seventeen members present. The minute of the last stated meeting was read, and on motion adopted. The minute of the Board of Trustees for September was presented, and on motion approved. The terms of three members of the Board of Trustees expiring with this date, as also the yearly terms of the Committee on Deceased Members, it was on motion resolved to hold an election. The names of the following gentlemen (the present incumbents), were placed in nomination for Trustees to serve three years: Messrs. A. P. Brown, D. S. Jones, and Henry Trimble, and also, the following as Committee on Deceased Members. Charles Bullock, Gustavus Pile, and Wallace Proctor, (also present incumbents). There being no other nominations offered, and, therefore, no opposition, the secretary was on motion directed to cast an affirmative ballot for all the candidates, which being done they were declared duly elected to their respective positions.

The report of the delegates to the recent session of the American Pharmaceutical Association held at Cincinnati being called for, the Chairman, Henry Trimble, presented the same which was on motion accepted, and directed to be placed upon the minutes. The following are condensed prominent statements in the report:—

"The report of the Committee on Re-organization was adopted with slight modification—this report changes radically the method of business procedure, and assigns the work to four sections as follows. Commercial Interests, Scientific Papers, Pharmaceutical Education, and Legislation; each section elects its own officers. Prominent among the amendments made to the by-laws is that which admits to membership without payment of the initial fee. The newly elected officers of the Association are to be installed in future at the closing session. An exhibit of products is to be held annually under the auspices of the Association, and the Association is to become, if possible, an incorporated body. There are about 1400 active members now on the roll, seventy having been elected at the last session. Of cash on hand $4,000 was assigned to the permanent fund. Three prizes are to be competed for annually for the best original papers: first, $75; second, $50; third, $25; and a prize for the best exhibit. The meeting, is on all sides acknowledged to have been both practically, and in a professional sense a success. Much credit for personal enjoyment is accredited

to the thoughtfulness of the druggists of Cincinnati. The next meeting takes place at Detroit."

The chairman announced the recent death of James Bowker of this city, elected a member in 1872. On motion adjourned.

W. B. THOMPSON,
Secretary.

PROCEEDINGS OF STATE PHARMACEUTICAL ASSOCIATIONS.

Kentucky, p. 72.—Tenth annual meeting; see July number, p. 371. Next meeting in Henderson, May 9, 1888. E. Y. Johnson, Louisville, Corresponding Secretary.

Massachusetts, p. 196.—Sixth annual meeting; see July number, p. 371. Time and place of the next annual meeting will be decided upon at the special meeting to be held in Boston, January 10, 1888.

New Jersey, p. 157.—Seventeenth annual meeting; see July number, p. 372. The volume contains an excellent phototype portrait of the late R. W. Vandervoort, formerly president of the Association. Next meeting in Morristown, May 16, 1888. H. M. Smith, chairman of Local Committee.

Pennsylvania, p. 198.—Tenth annual meeting; see July number, p. 373. Next meeting in Titusville, June 12, 1888. Chas. D. Lippincott, Assistant Secretary.

VARIETIES.

A caution concerning the use of blisters.—J. Comby (*Progr. Méd.*) reports the case of a child, two years old, which, having been attacked with double broncho-pneumonia in the course of measles, was treated by the application of two large blisters, one of which was kept on for six hours and the other for four. A fortnight afterward, the surfaces to which they had been applied were occupied by large suppurating and gangrenous sores, and the child died three days subsequently. In the author's opinion, its death was hastened by the blisters, and he adds the general warning that blisters should be used only with the greatest caution in children, especially where from the nature of the disease there is reason to apprehend the supervention of a diphtheritic complication, and never in children's hospitals.—*N. Y. Med. Jour.*, Aug. 13.

EDITORIAL DEPARTMENT.

POISONING BY CHROMATE OF LEAD.—In the August number, page 431, we have referred to the cases of poisoning caused by the eating of buns which had been colored with chromate of lead. Professor J. J. Reese has since published in *Medical News*, August 27th, the results of the chemical examination made by himself in conjunction with Dr. H. Leffmann. The bodies of four of the victims were disinterred. Two of these had been buried about two

years; one about five months; and one a little over one month. In addition to these the liver and spleen of a child recently deceased were examined. The investigation was made by first exsiccating the parts and then carefully incinerating them, generally with the repeated addition of a small quantity of nitric acid to effect the complete destruction of the organic matter. The ash thus obtained was next dissolved in dilute nitric acid at a moderate heat, filtered, evaporated to dryness, again dissolved in distilled water and was now ready for the different tests for lead, sulphuretted hydrogen, dilute sulphuric acid, potassa, potassium hydrate, potassium bi-chromate and metallic zinc being used for the purpose. The liver and kidney, in some cases, also the brain, spinal cord and stomach, were examined and afforded decided evidence of the presence of lead, but the heart and lower jaw of one of the bodies gave no appreciable results.

Before concluding his report Professor Reese makes the following observations:

"The point of most interest in the above cases—physiologically and toxicologically considered—is probably the fact of the detection of lead after death in the two great nervous centres, the brain and spinal cord. It has been asserted by some who have experimented with this poisonous metal on the lower animals, that it has a special affinity for these organs, and that it was found after death in them in greater abundance than even in the liver. The results of our experiments upon the human subject, as above detailed, do not confirm this statement, but, on the contrary, show that the liver, as a general rule, contains more of the absorbed poison than any of the other viscera; and they point to this gland as the great eliminating organ for poisons from the human body."

TEAR BLANKET TREE AND STENOCARPINE.—During the past month or two many of the medical journals gave accounts of experiments made with a substance claimed to be an alkaloid, and to possess properties closely analogous to those of cocaine. The history of this substance is given as follows:

"During the past fall, Mr. M. Goodman, veterinary surgeon, in traveling through West Feliciana Parish, La., had occasion to apply a poultice to the fetlock of one of his horses. Having none of the customary means at hand with which to make it, he raked together a number of leaves from the ground, and having saturated them with hot water, applied the mass as a poultice to the inflamed part. After the swelling had arrived at a proper condition, he made a free incision into the part without the horse giving any evidence of pain. It occurred to him that the leaves might have anæsthetic properties; and a few weeks after, having occasion to open an inflamed bursa on the elbow of another horse, he made a similar poultice, applied it as before, and again made the incision without any pain to the animal.

"Mr. Goodman states that the tree is known in the locality mentioned as the *Tear Blanket Tree*. It grows to the height of 35 to 40 feet, with a diameter to the bole of about 18 inches, and a spread of foliage of about 30 to 35 feet. The leaves resemble those of an acacia. The bark is smooth. From the ground up, the tree is furnished with clumps of forked spines or thorns, the parent spine springing at right angles from the bough or trunk. Though Mr. Goodman is a native of the region, he has never seen the tree blossom. As fruit it bears pods 8 or 10 inches in length, flat and slightly curved, containing seeds and a viscid juice. The spines are very tough and highly polished, and the wood is extremely tough. It grows in clumps and singly, and is abundant in Louisiana.

"From the likeness of the tree to the Acacia stenocarpa, Dr. Seward who made a chemical examination of the leaves dubbed the new alkaloid *stenocarpin*. It would have been better, however, to withhold the naming of the alkaloid until the botanical name of the tree had been known."

The criticism in the last sentence quoted is unquestionably proper. But in carefully reading these accounts, several other points assume a rather mysterious appearance. In the first place, the name "tear blanket tree" cannot be found in any of the southern floras which we have consulted, nor in the Catologue of the Forest Trees of North America, by Prof. E. S. Sargent, or in the same author's excellent and comprehensive Report on the Forests of North America, issued as a part of the publications in connection with the tenth census of the United States. In the latter work the vernacular names have been carefully collected; the absence of the one quoted above, however, cannot be regarded as proving that it is not used in certain localities. If the leaves of the mysterious tree really possess valuable medicinal or other properties, the identification of the tree itself would seem to be an easy matter for one of the numerous botanists who are intimately acquainted with the flora of the southern and southwestern States. Instead of consulting a botanist, the tree is simply stated to resemble the Acacia stenocarpa. But has this tree been selected on account of its being familiar to the public or to pharmacists or to physicians? In answer to this we must state that Acacia stenocarpa is indigeneous to Abyssinia and Nubia, where it is known as *talha*, *talch* or *kakul*, and where a limited quantity of colored gum is collected from it. The habit of this tree is therefore not generally known, and to liken to its appearance that of an American tree is a simile of very questionable utility or propriety.

But this comparison would seem to indicate that the enigmatic tree belongs to the mimosæ, or is closely related to them. By consulting Prof. Sargent's Report it will be found that twenty-seven trees of the leguminosæ are found on North American soil, nine of which belong to the sub-order mimosæ, but do not grow wild in Louisiana, since the eastern limit of seven lies in some parts of Texas, and two belonging to the West Indian flora merely reach northward into the semi-tropical parts of Florida.

Of the ten papilionaceous trees not one is mentioned as growing in Louisiana; but two out of the eight cæsalpiniaceous trees grow in that State, namely, Cercis canadensis, *Lin.*, the well known *red bud* or *Judas tree*, and Gleditschia monosperma, *Walter*, known in the southern States as *water-locust*, and occasionally as *water-honey-locust*. Only the latter is thorny, and in this respect resembles the above named acacia. The water-locust grows from South Carolina to Matanzas Inlet and Tampa Bay, Florida, through the Gulf States to the valley of the Brazos River, Texas, and through Arkansas to Middle Kentucky and Tennessee, Southern Indiana and Illinois. The "Report on the Forests" gives the following particulars:

"A tree 12 to 18 meters in height, with a trunk sometimes 0.60 or, exceptionally, 0.90 meter in diameter; deep swamps; rare in the South Atlantic and Gulf States; common and reaching its greatest development in the bottom lands of southern Arkansas, Louisiana, and eastern Texas, here

often covering extensive areas. Wood heavy, very hard, strong, rather coarse-grained, compact, susceptible of a high polish; layers of annual growth clearly marked by one to three rows of open ducts; medullary rays thin, conspicuous; color, rich bright brown, tinged with red, the thick, heavier sap-wood clear light yellow; specific gravity, 0.7342; ash, 0.73."

It may, perhaps, be objected that we have devoted more space to this subject than its importance deserves; but the mystery which has been unnecessarily thrown around it, is akin to mystification. At any rate, it must be acknowledged that the plant could have been readily identified, before anything with scientific pretense was published, and that the term stenocarpine has not the shadow of a right to be applied to a substance claimed to have been isolated from an American tree which *seems* to be the water-locust of our Southern States.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Pennsylvania Poison Register.—Prepared in accordance with the late Pharmacy Bill, regulating Sale of Poisons. Lebanon, Pa., 1887. Fred. W. Frost. Price $1.50.

This is a blank book for the registration of the sales of poisons. It is well bound, and is made of heavy ledger paper, the leaves being 8x10½ inches, neatly ruled, and with printed headings for the different columns, to facilitate full compliance with the requirements of the law. The first page contains a reprint of Section 10 of the Pharmacy law, which relates to the sale of poisons; and this is followed by a list of poisons which should be registered in conformity with the law, namely, those "which are known to be destructive to adult human life in quantities of five grains or less." Only a few of this class are popularly known and to some extent employed, mostly for the destruction of vermin, such as arsenic, corrosive sublimate, nux vomica and strychnine; or for medicinal or technical purposes, like croton oil, potassium cyanide, and mercuric oxide; the largest number of such poisons are found among the alkaloids, which are pretty fully enumerated; atropine, however, being omitted, while daturine, duboisine and hyoscyamine are mentioned, together with a number of others.

The *Register* can be recommended, because it is useful, conveniently arranged, and offered at a low price considering the quality of the work.

Hand-buch der praktischen Pharmacie für Apotheker, Drogisten, Ærzte und Medicinal-Beamte. Bearbeitet von Dr. H. Beckurts und Dr. Bruno Hirsch. Stuttgart: Ferdinand Enke, 1887. 3–5 Lieferung.

Hand-book of practical pharmacy for apothecaries, druggists, physicians and medical officers. Fascicles 3 to 5. Price 2 marks each.

Referring to our notice of this excellent work, on page 378, in our July number, it remains now to state that the chapters on operations and apparatus are brought to a close in fascicle 3 by a very lucid account of polarization and description of apparatus employed for this purpose. Part I closes with a chapter on pharmaceutical book-keeping.

Part II treats of the medicaments and other commodities kept in phar-

macies, and arranged in alphabetical order, with accounts of their origin, mode of preparation, recognition and examination. The nomenclature is adapted in analogy with that of the German pharmacopœia. Not less than eighteen different pharmacopœias, including that of the United States, have been consulted, and of several two or three different editions have been used. Articles which have not been admitted into any one of the pharmacopœias, but which are, to some extent, medicinally employed, including the new remedies, are considered more or less extensively in accordance with their character and importance. The fascicles before us describe in the manner indicated 281 drugs and preparations, the list opening with absinthiinum (absinthiin), and the last one being butyl-chloralum hydratum (butylchloral, formerly called crotonchloral hydrate). In cases where different formulas are authorized in the several countries for a preparation, the composition is shown in a tabular manner, thus bringing to prominent notice not only the difference in the ingredients used, but likewise the variations in the proportion of the same. This portion of the work, therefore, promises to become a kind of universal pharmacopœia, through the critical compilation of pharmacopœial and other drugs and preparations used in more than a dozen countries of Europe and in the United States. A number of the articles having been carefully examined, we found them as was expected, to be correct and complete for all practical purposes of the apothecary and druggist.

OBITUARY.

Stanislas Martin died in Paris last June aged 81 years. He was born at Issoudun, August 8th, 1806, became an apprentice in pharmacy in 1822, and went to Paris in 1837, where he subsequently established himself and was engaged in business until some years ago. For a number of years he was president of the Paris Société de Pharmacie, and in former years contributed many practical papers to various journals, several of which were translated and published in the AMERICAN JOURNAL OF PHARMACY. The deceased was an honorary member of the American Pharmaceutical Association.

Stanislas Limousin died in Paris after a lingering illness, April 9th, last. He was born in Ardentes, and become an apprentice in Paris in the store of Mr. Gobley. For about twenty years he was established in business. He contributed numerous papers on various subjects to different journals, and originated a number of improvements in apparatus, utensils and in the administration of medicines, among the latter the wafer capsules (*cachets de pain*).

Ernest William Reinecke, Ph. G., class 1870 of the Philadelphia College of Pharmacy, died in Pittsburg, June 1st, of typhoid fever. The deceased was a studious pharmacist and had succeeded in building up a prosperous business in his native city.